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CHOI et al.

(54) METHOD FOR PERFORMING TASK AND ELECTRONIC DEVICE SUPPORTING THE SAME

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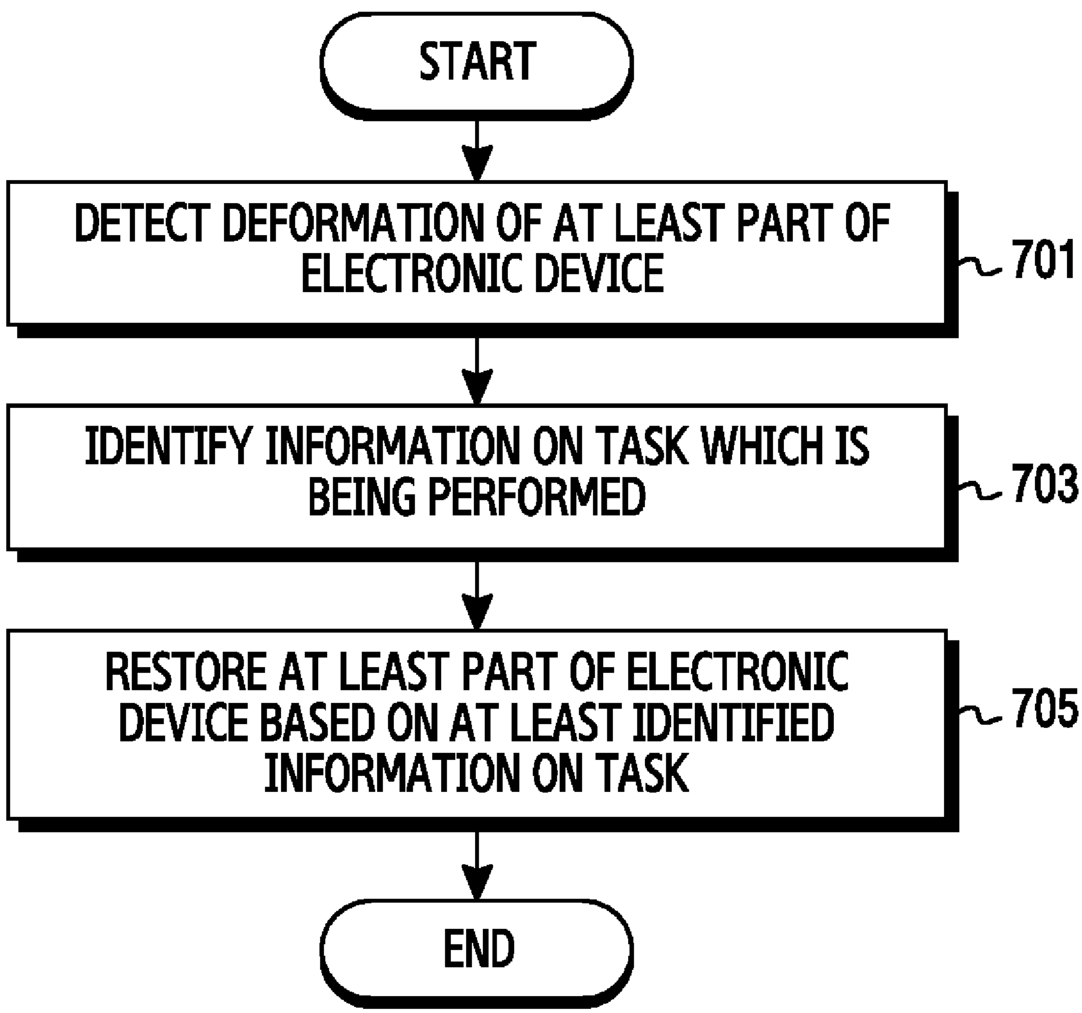
CPC *G06F 9/461* (2013.01); *G06F 1/1641* (2013.01)

(57) **ABSTRACT**

A method for performing a task in an electronic device includes: detecting a deformation of at least a part of the electronic device; identifying information on a task which is performed in the electronic device; and restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task.



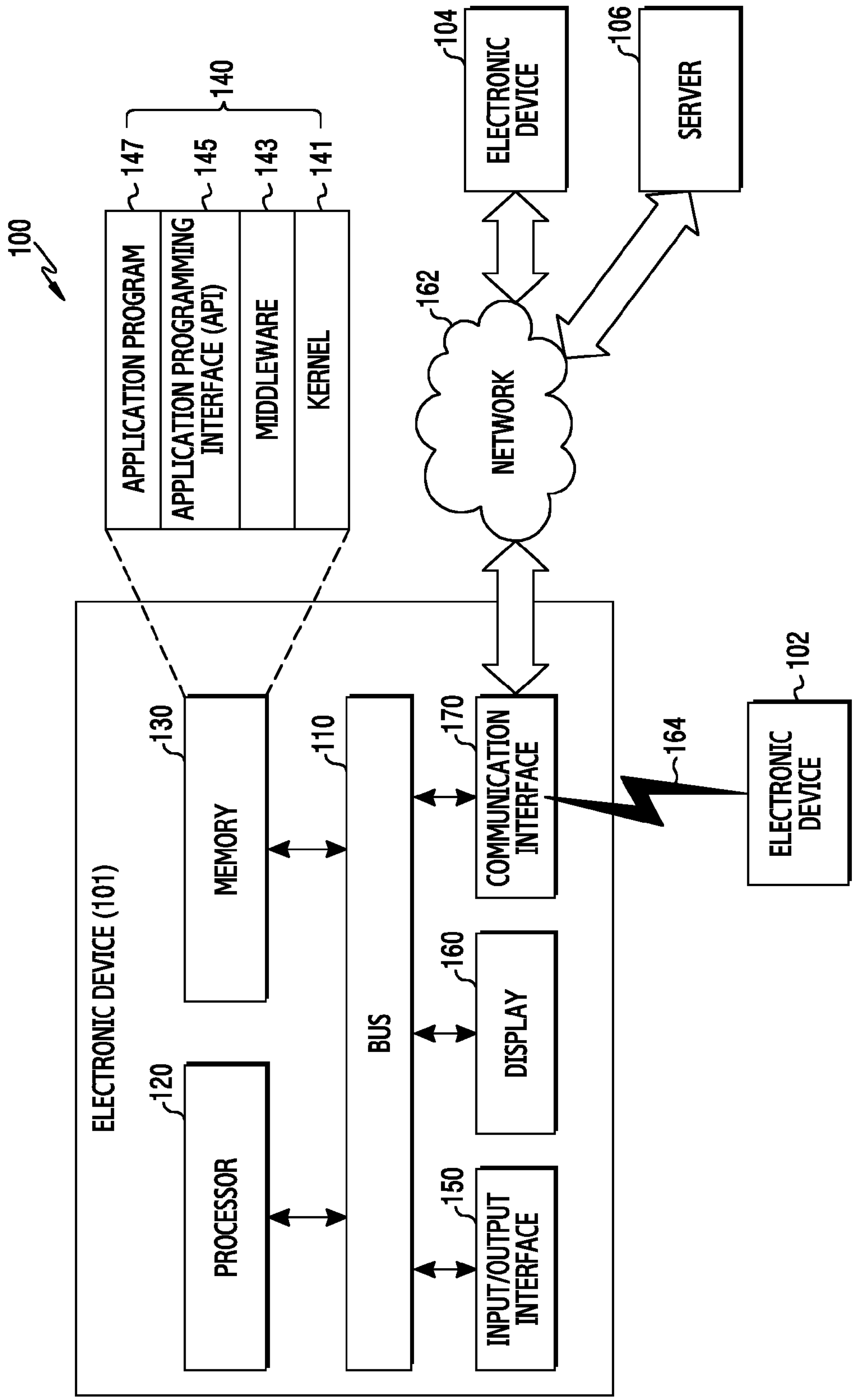

100
140
147
145
143
141
APPLICATION PROGRAM
APPLICATION PROGRAMMING INTERFACE (API)
MIDDLEWARE
KERNEL
104
ELECTRONIC DEVICE
106
SERVER
162
NETWORK
ELECTRONIC DEVICE (101)
130
MEMORY
120
PROCESSOR
110
BUS
170
COMMUNICATION INTERFACE
160
DISPLAY
150
INPUT/OUTPUT INTERFACE
164
102
ELECTRONIC DEVICE

FIG.1

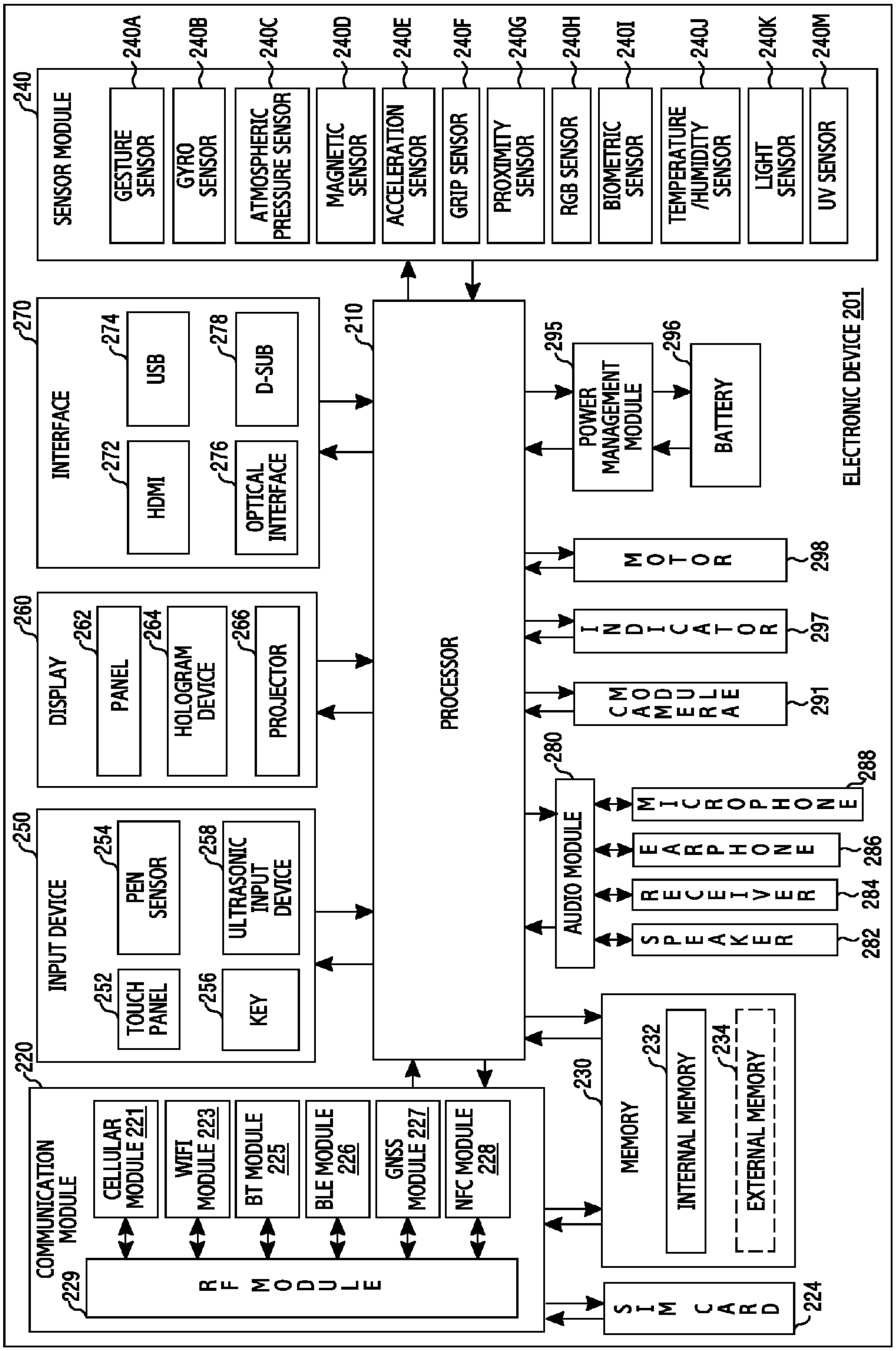

SENSOR MODULE
240
GESTURE SENSOR
240A
GYRO SENSOR
240B
ATMOSPHERIC PRESSURE SENSOR
240C
MAGNETIC SENSOR
240D
ACCELERATION SENSOR
240E
GRIP SENSOR
240F
PROXIMITY SENSOR
240G
RGB SENSOR
240H
BIOMETRIC SENSOR
240I
TEMPERATURE /HUMIDITY SENSOR
240J
LIGHT SENSOR
240K
UV SENSOR
240M
INTERFACE
270
HDMI
272
USB
274
OPTICAL INTERFACE
276
D-SUB
278
PROCESSOR
210
POWER MANAGEMENT MODULE
295
BATTERY
296
ELECTRONIC DEVICE 201
DISPLAY
260
PANEL
262
HOLOGRAM DEVICE
264
PROJECTOR
266
MOTOR
298
INDICATOR
297
CAMERA MODULE
291
INPUT DEVICE
250
TOUCH PANEL
252
PEN SENSOR
254
KEY
256
ULTRASONIC INPUT DEVICE
258
AUDIO MODULE
280
MICROPHONE
288
EARPHONE
286
RECEIVER
284
SPEAKER
282
COMMUNICATION MODULE
220
CELLULAR MODULE 221
WIFI MODULE 223
BT MODULE 225
BLE MODULE 226
GNSS MODULE 227
NFC MODULE 228
RF MODULE
229
MEMORY
230
INTERNAL MEMORY
232
EXTERNAL MEMORY
234
SIM CARD
224

FIG. 2

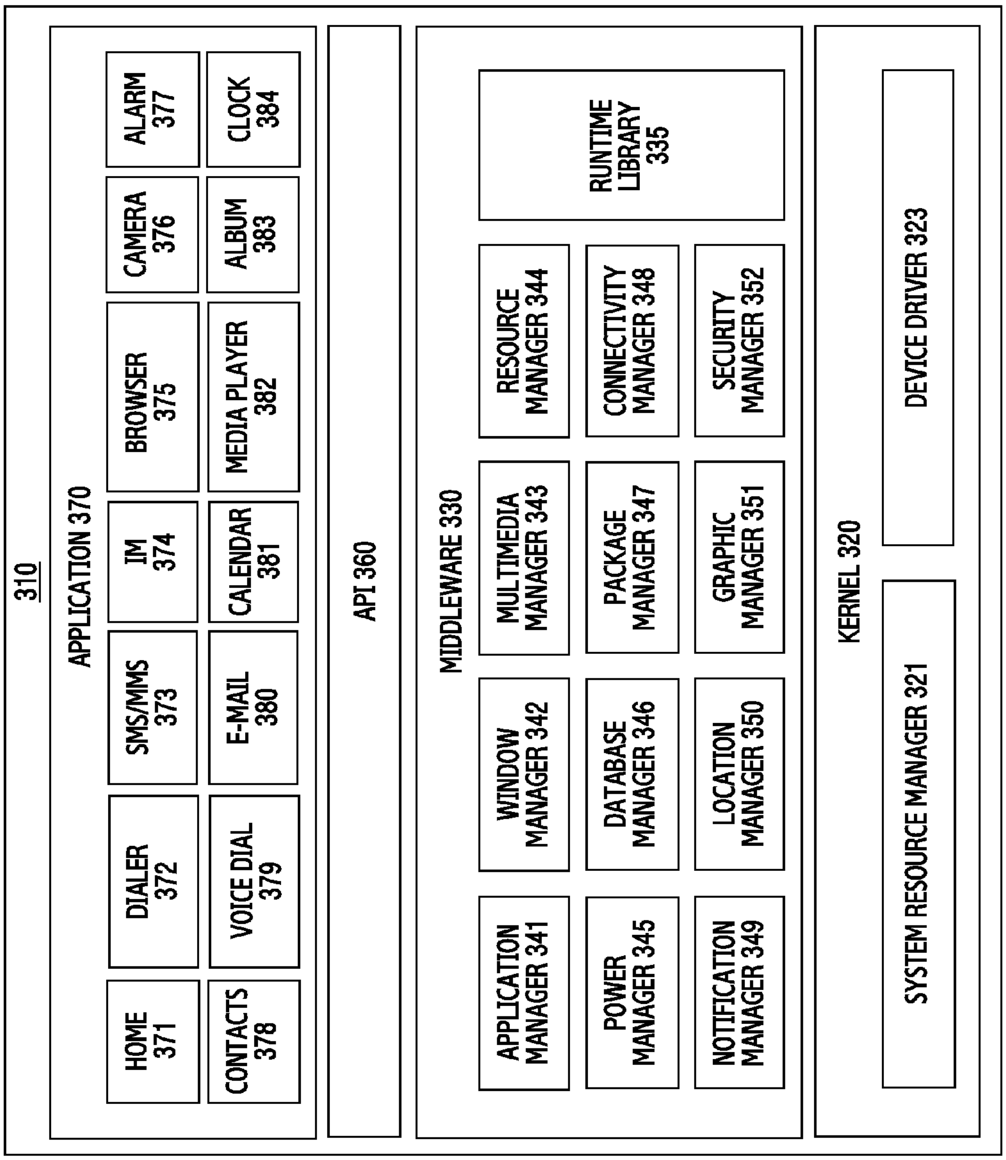

310
APPLICATION 370
HOME 371
DIALER 372
SMS/MMS 373
IM 374
BROWSER 375
CAMERA 376
ALARM 377
CONTACTS 378
VOICE DIAL 379
E-MAIL 380
CALENDAR 381
MEDIA PLAYER 382
ALBUM 383
CLOCK 384
API 360
MIDDLEWARE 330
APPLICATION MANAGER 341
WINDOW MANAGER 342
MULTIMEDIA MANAGER 343
RESOURCE MANAGER 344
RUNTIME LIBRARY 335
POWER MANAGER 345
DATABASE MANAGER 346
PACKAGE MANAGER 347
CONNECTIVITY MANAGER 348
NOTIFICATION MANAGER 349
LOCATION MANAGER 350
GRAPHIC MANAGER 351
SECURITY MANAGER 352
KERNEL 320
SYSTEM RESOURCE MANAGER 321
DEVICE DRIVER 323

FIG.3

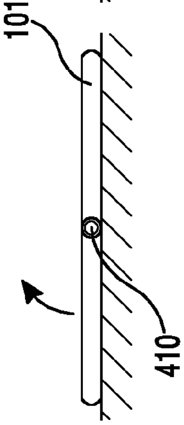


FIG.4A

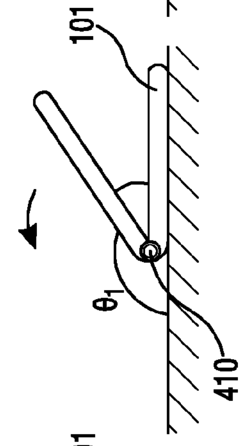


FIG.4B

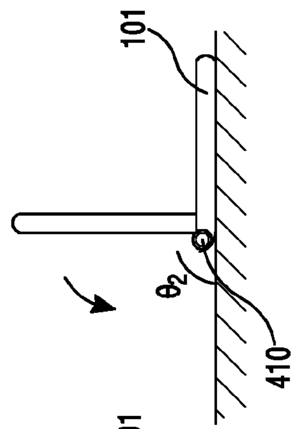


FIG.4C

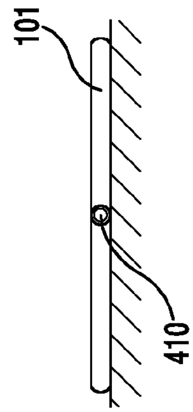


FIG.4D

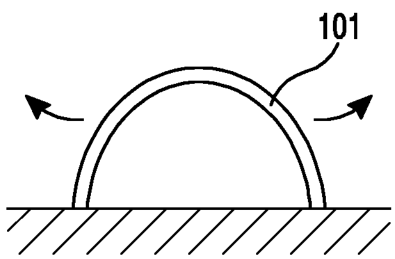


FIG.5A

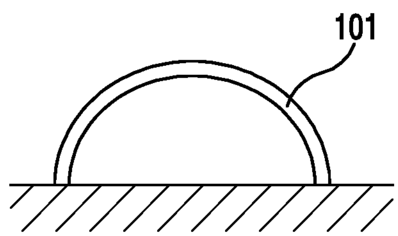


FIG.5B

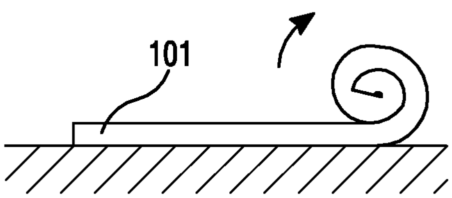


FIG.6A

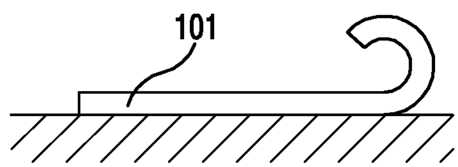


FIG.6B

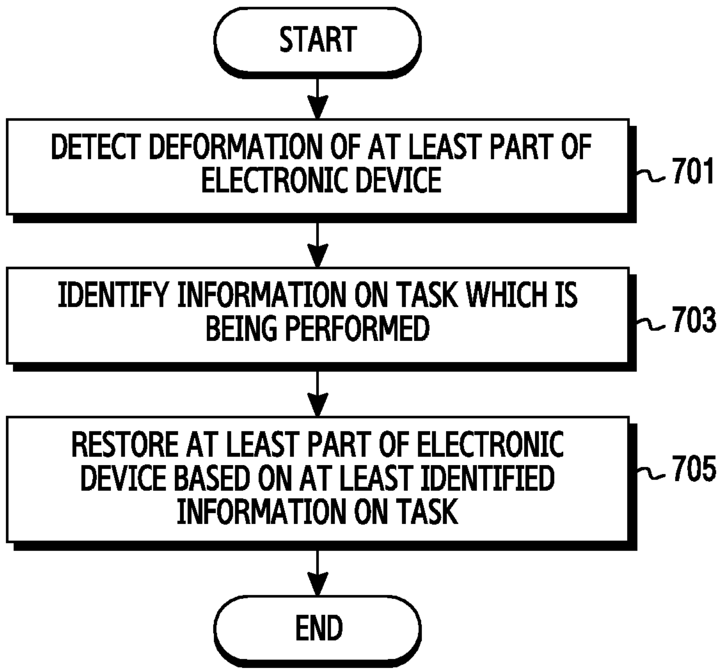

START
DETECT DEFORMATION OF AT LEAST PART OF ELECTRONIC DEVICE
701
IDENTIFY INFORMATION ON TASK WHICH IS BEING PERFORMED
703
RESTORE AT LEAST PART OF ELECTRONIC DEVICE BASED ON AT LEAST IDENTIFIED INFORMATION ON TASK
705
END

FIG.7

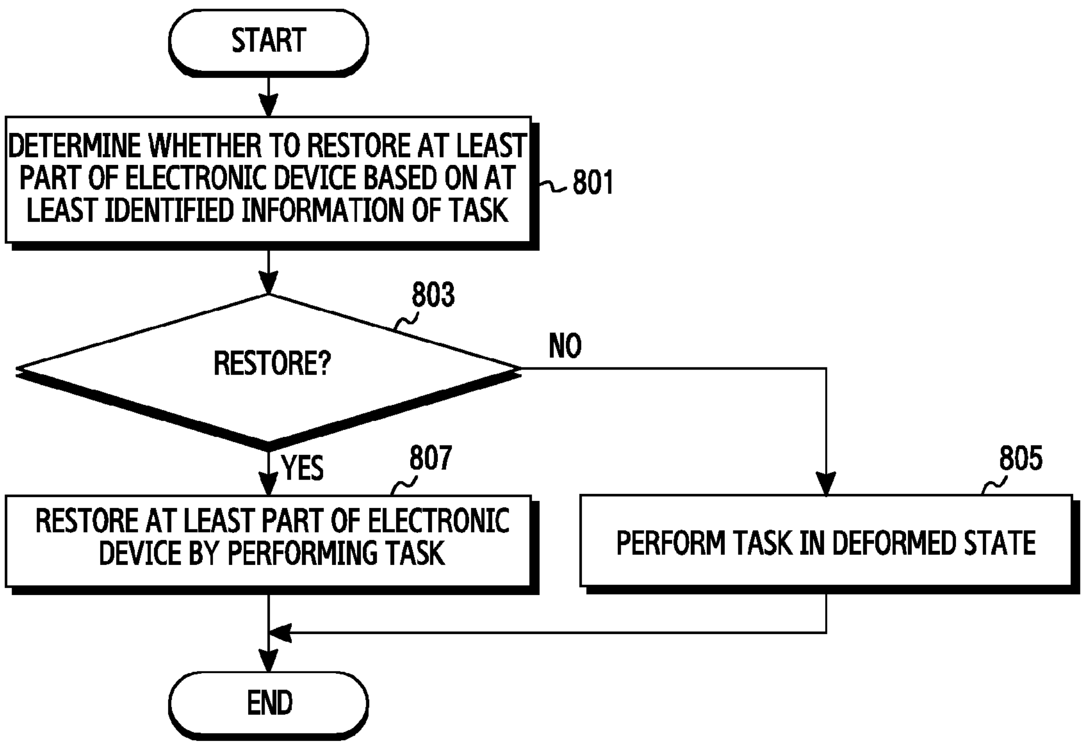

START
DETERMINE WHETHER TO RESTORE AT LEAST PART OF ELECTRONIC DEVICE BASED ON AT LEAST IDENTIFIED INFORMATION OF TASK
801
803
RESTORE?
NO
YES
807
RESTORE AT LEAST PART OF ELECTRONIC DEVICE BY PERFORMING TASK
805
PERFORM TASK IN DEFORMED STATE
END

FIG.8

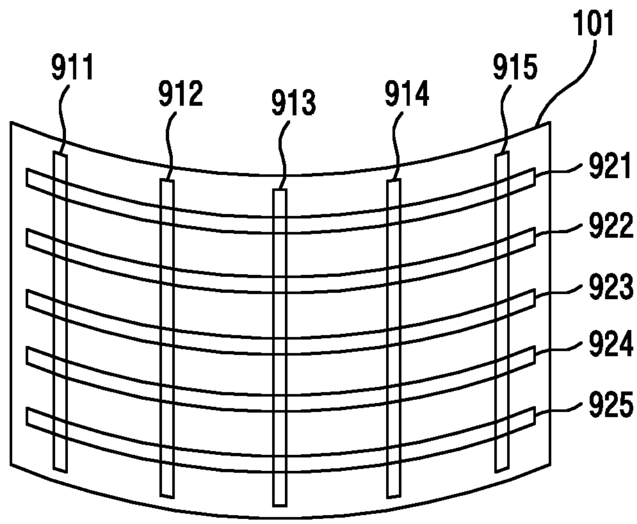


FIG.9A

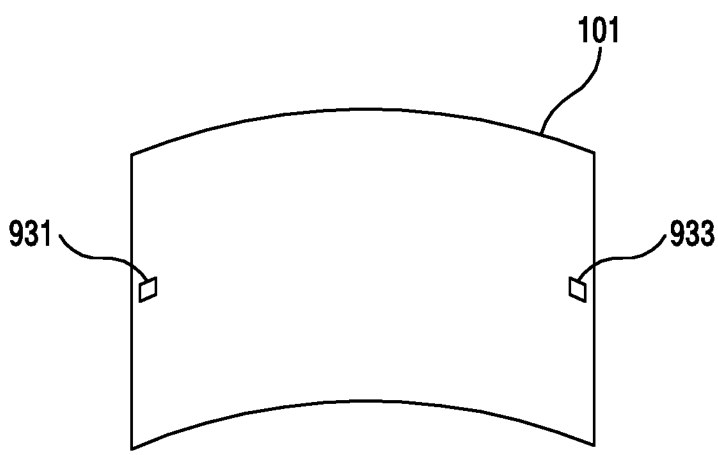


FIG.9B

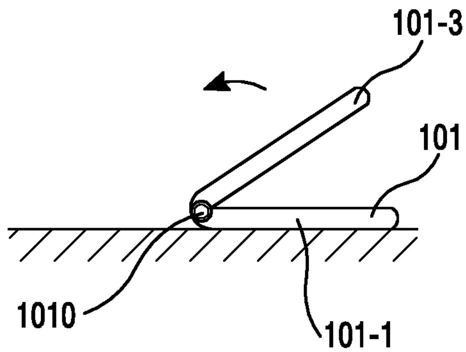


FIG.10A

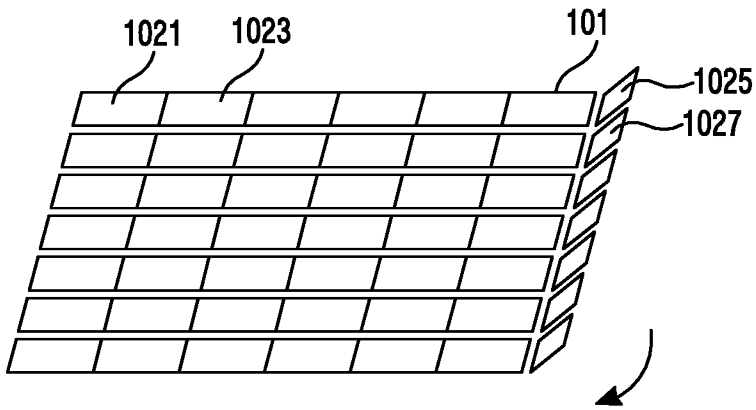


FIG.10B

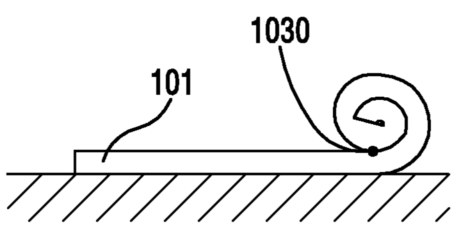


FIG.10C

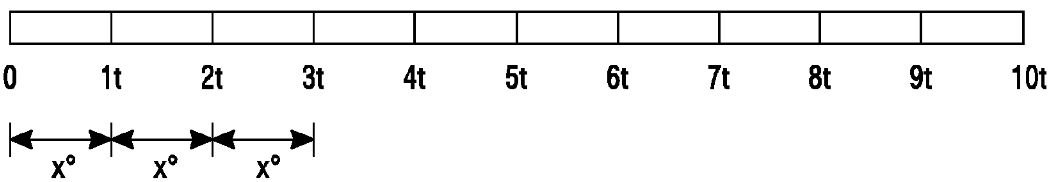


FIG.11A

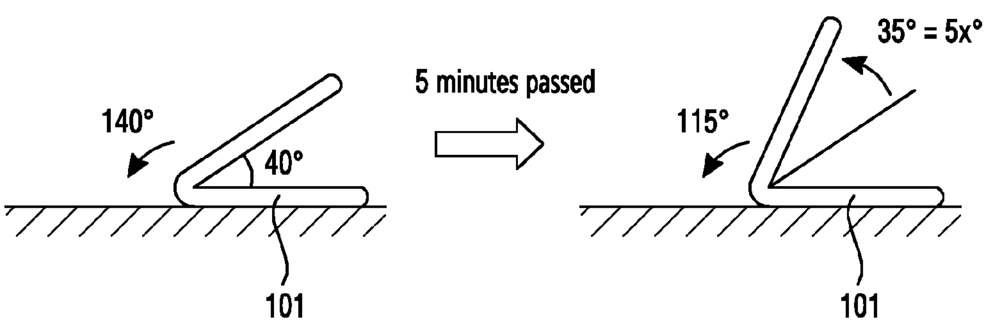


FIG.11B

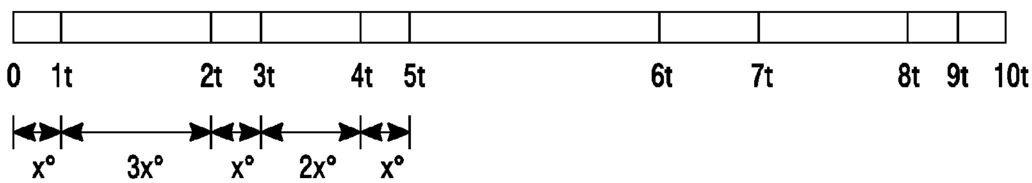


FIG.12A

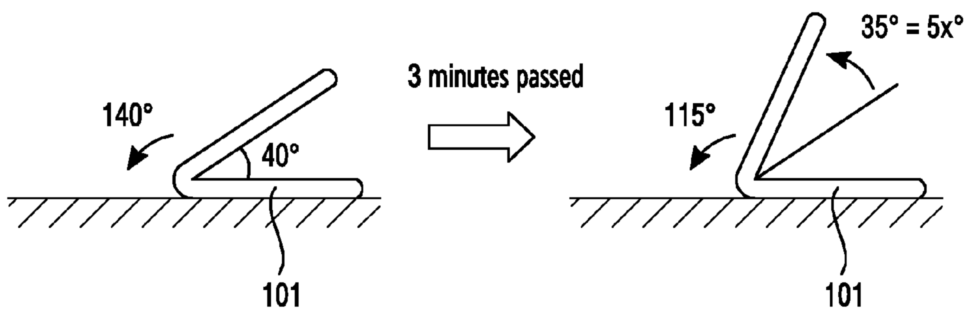


FIG.12B

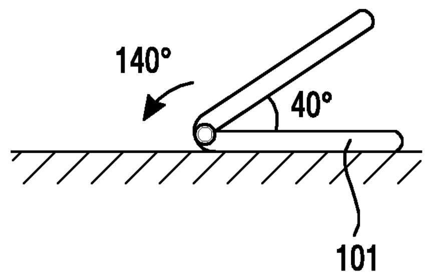


FIG.13A

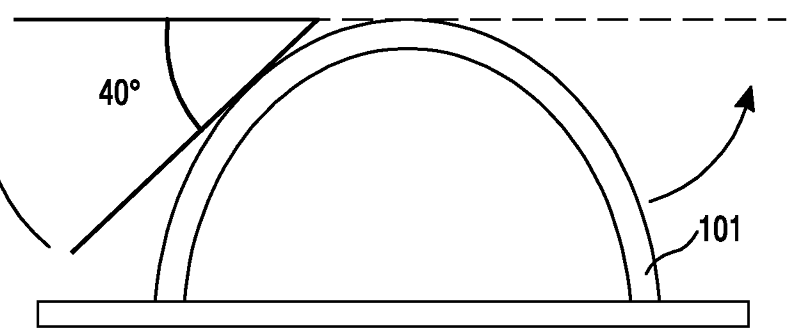


FIG.13B

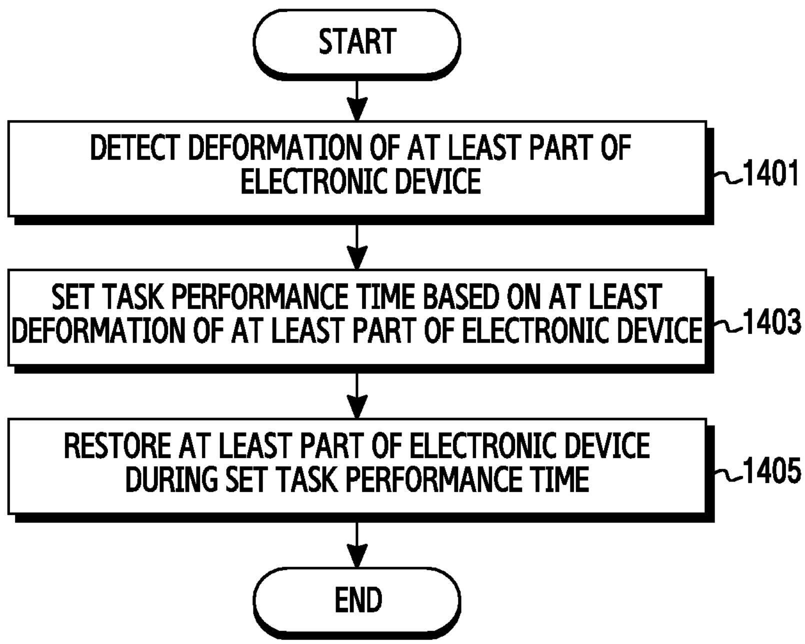

START
DETECT DEFORMATION OF AT LEAST PART OF ELECTRONIC DEVICE
1401
SET TASK PERFORMANCE TIME BASED ON AT LEAST DEFORMATION OF AT LEAST PART OF ELECTRONIC DEVICE
1403
RESTORE AT LEAST PART OF ELECTRONIC DEVICE DURING SET TASK PERFORMANCE TIME
1405
END

FIG.14

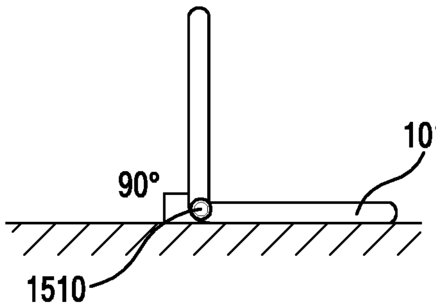


FIG.15A

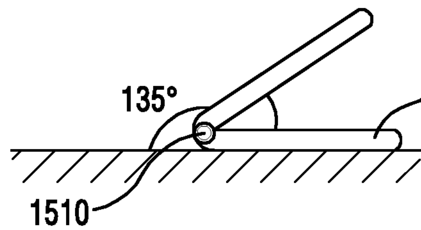


FIG.15B

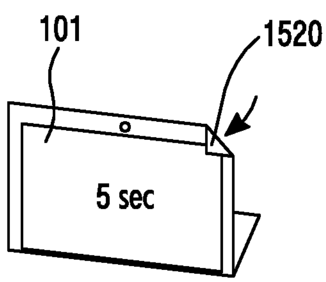


FIG.15C

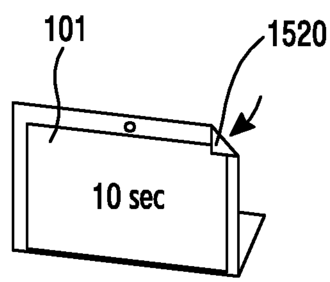


FIG.15D

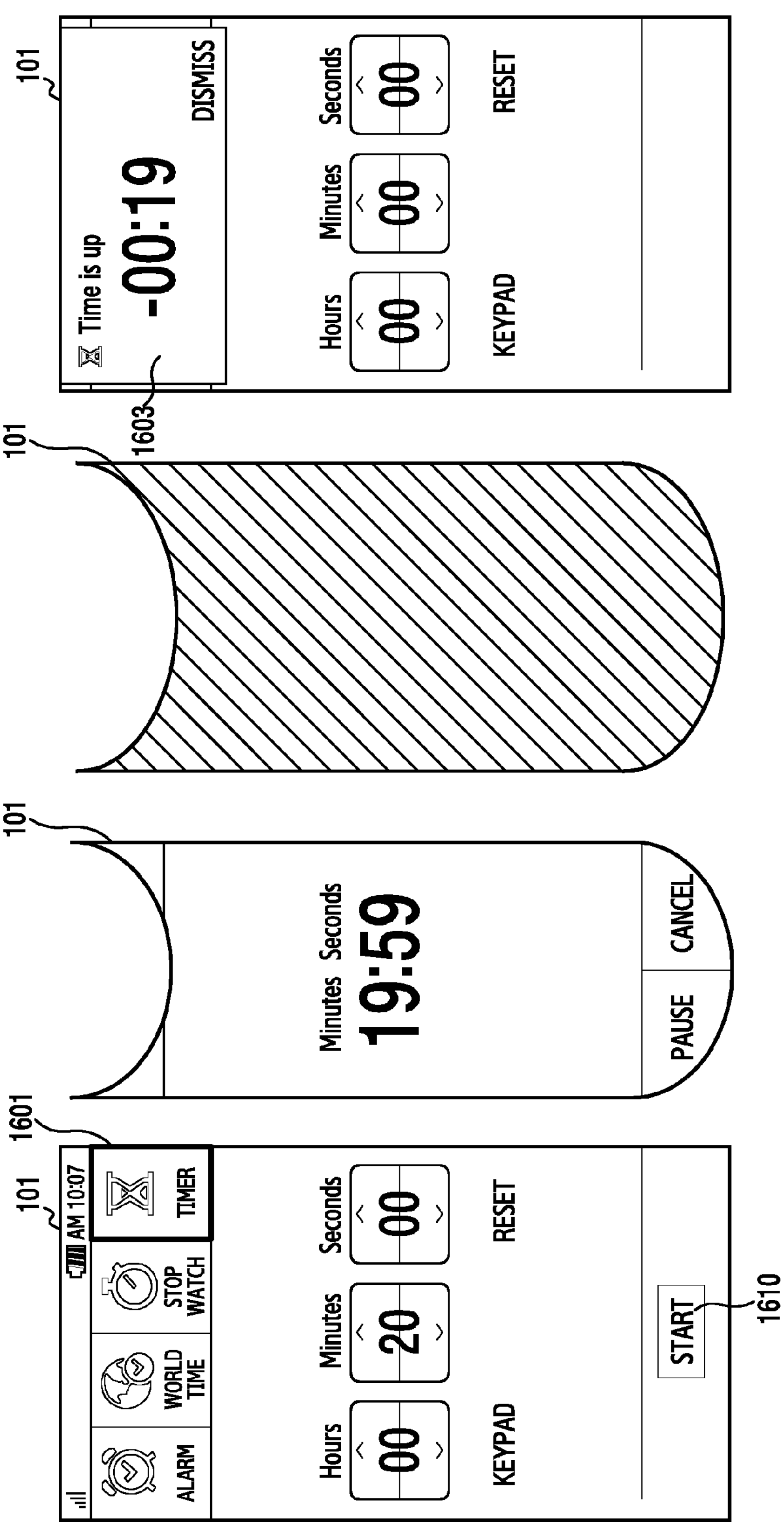


FIG.16A FIG.16B FIG.16C FIG.16D

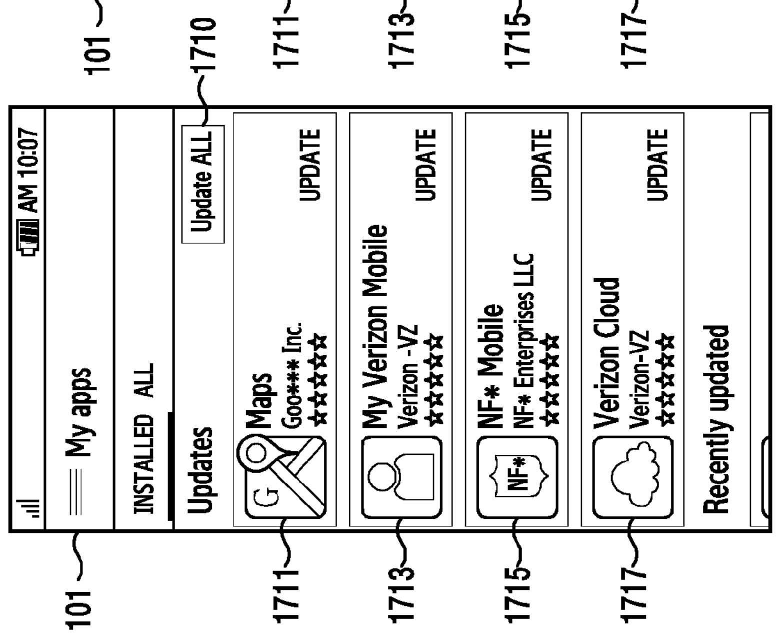


FIG.17A

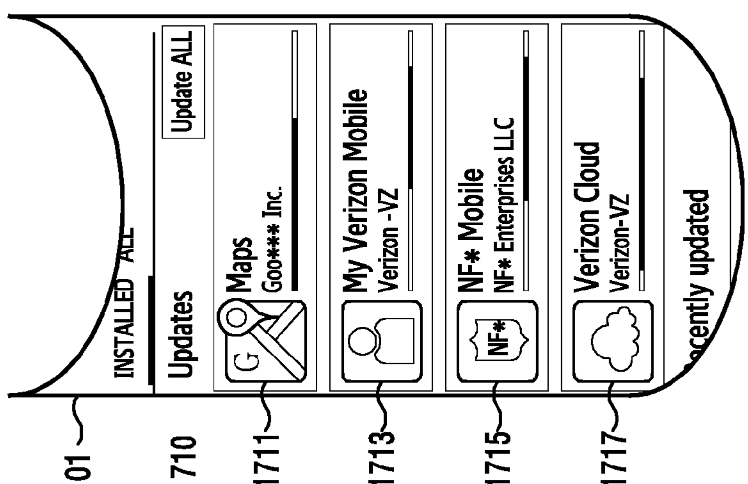


FIG.17B

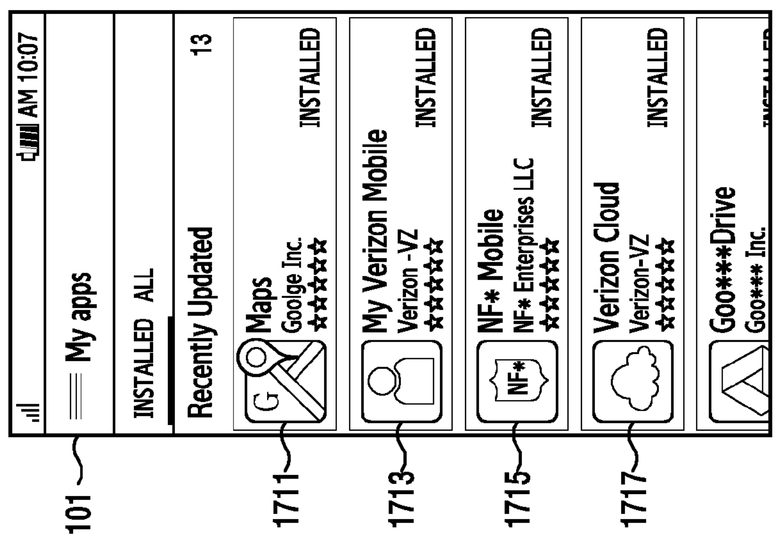


FIG.17C

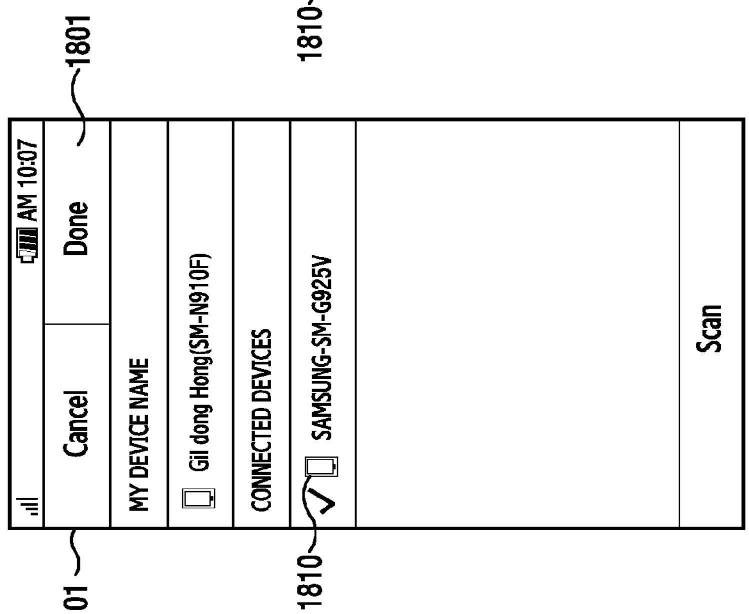


FIG.18A

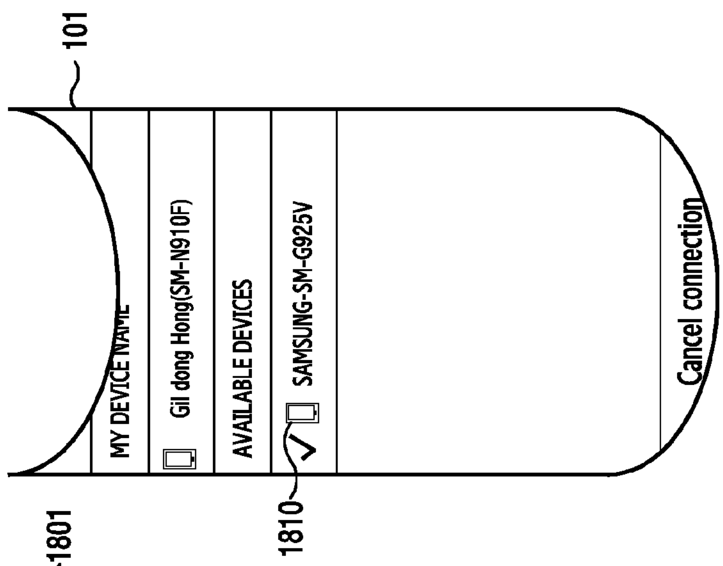


FIG.18B

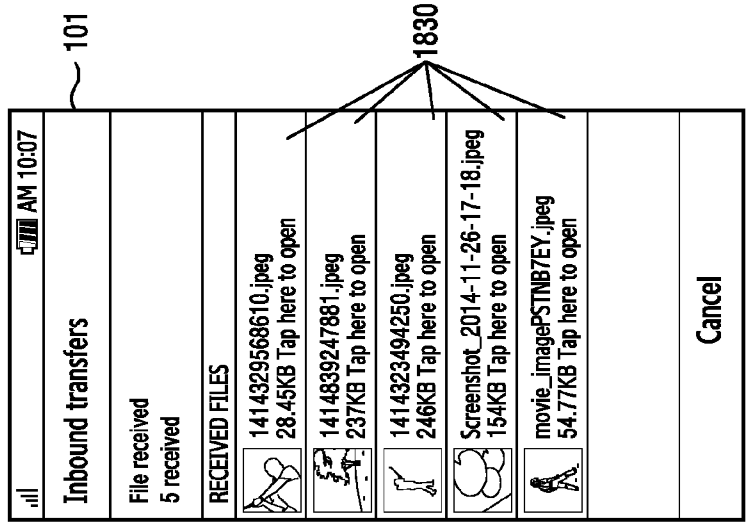


FIG.18C

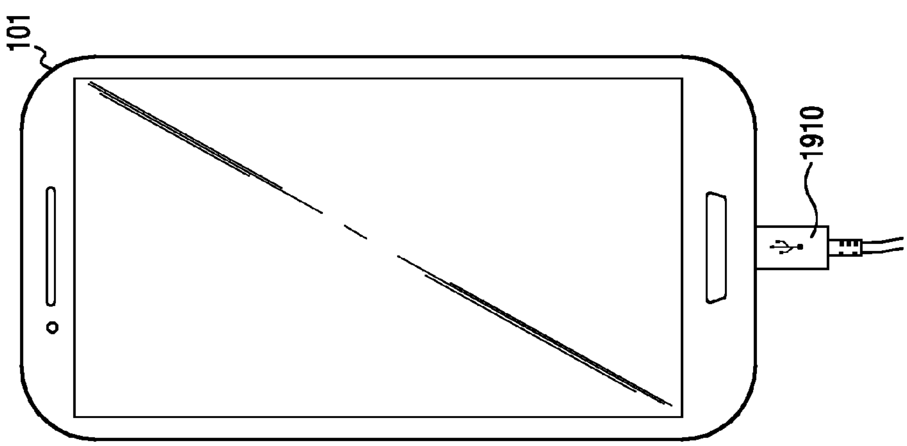


FIG.19A

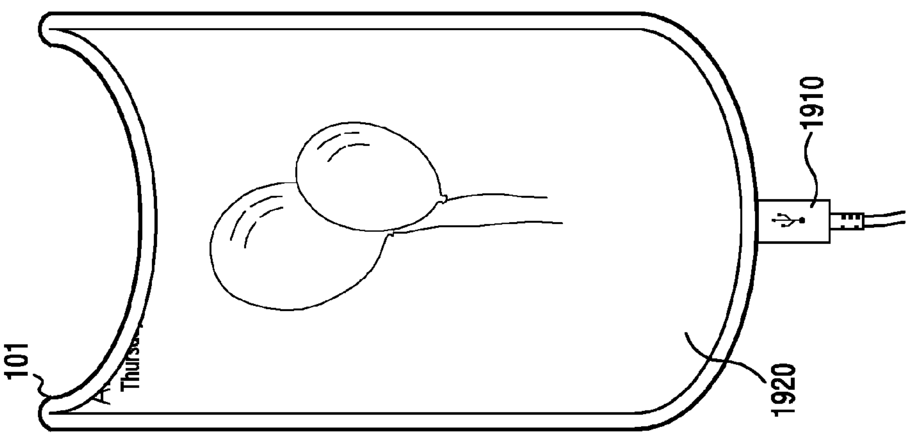


FIG.19B

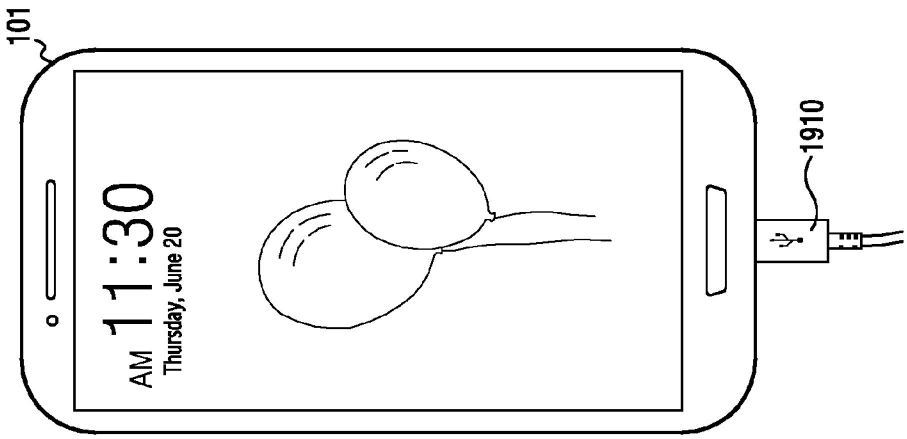


FIG.19C

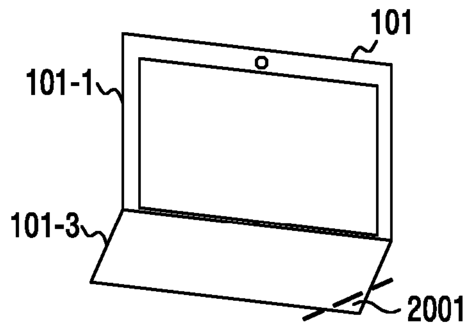


FIG.20A

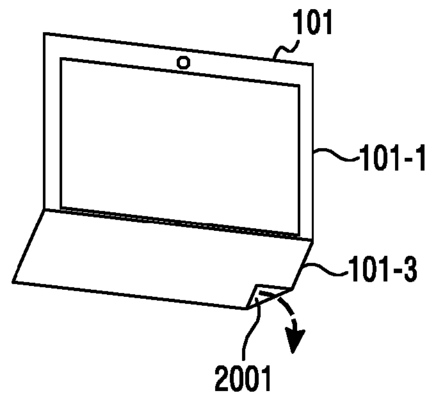


FIG.20B

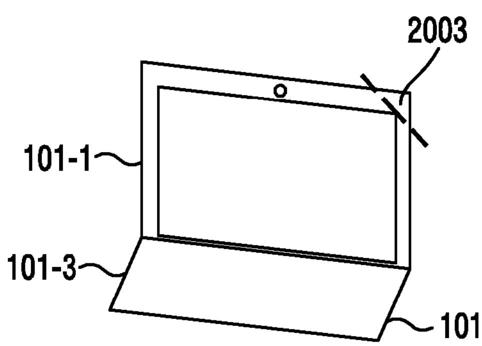


FIG.20C

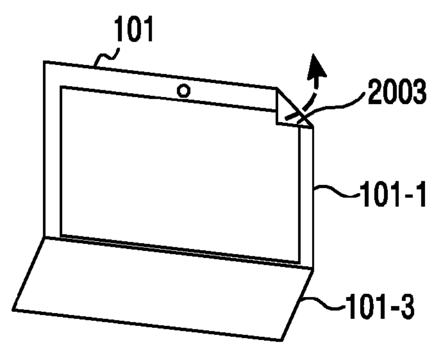


FIG.20D

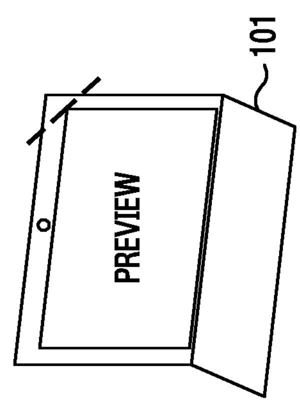


FIG.21A

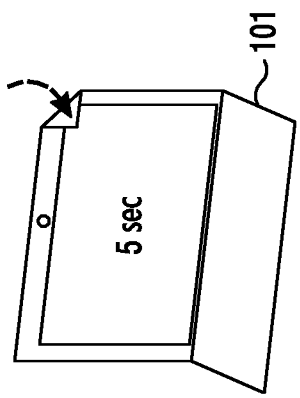


FIG.21B

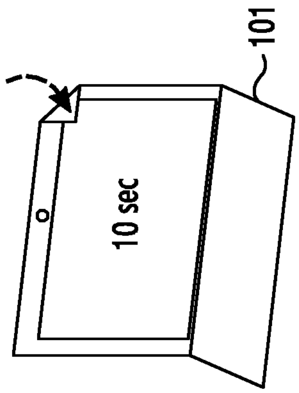


FIG.21C

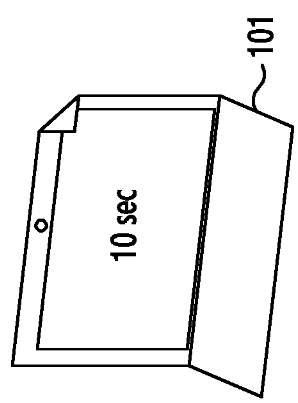


FIG.21D

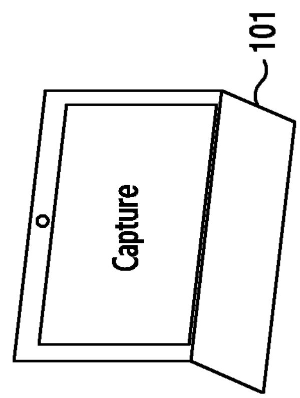


FIG.21E

METHOD FOR PERFORMING TASK AND ELECTRONIC DEVICE SUPPORTING THE SAME

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application is based on and claims priority under 35 U.S.C. §119 to an application filed in the Korean Intellectual Property Office on Dec. 18, 2015 and assigned Serial No. 10-2015-0181707, the contents of which are incorporated by reference herein in its entirety.

BACKGROUND

[0002] 1. Technical Field

[0003] The present disclosure relates generally to a method for performing a task and an electronic device supporting the same.

[0004] 2. Description of Related Art Thanks to the remarkable development of information and communications technology and semiconductor technology, the distribution and use of electronic devices (for example, mobile terminals) are rapidly increasing.

[0005] The electronic devices did not stay in their respective transitional fields and have been developed into the stage of convergence embracing fields of other devices. For example, the electronic devices provide various functions such as a timer function, file transmission, playing music, playing a video, or the like to users using applications, in addition to a telephony function.

[0006] In recent years, research on flexible electronic devices is being carried out to live up to users' needs for new and various functions. The flexible electronic device refers to an electronic device which has a characteristic of having its shape changed like paper. For example, in the flexible electronic device, an inner configuration including a display can be bent, folded, or rolled.

[0007] The flexible electronic device provides a variety of functions using the characteristic of being flexibly deformed. For example, the flexible electronic device may provide a function of outputting a screen through an unfolded portion of the display when the display is folded.

SUMMARY

[0008] There is a need for various methods for using operations of the flexible electronic devices based on the unique characteristic of the flexible electronic device.

[0009] Various example embodiments of the present disclosure provide a method for performing a task, which provides a task performance state of an electronic device using operations of deforming a flexible electronic device and returning the deformed electronic device to its original state, and an electronic device supporting the same.

[0010] The various aspects addressed by the present disclosure are not limited to the above-mentioned techniques, and other aspects that are not mentioned can be clearly understood by a person skilled in the art based on the following descriptions.

[0011] According to various example embodiments of the present disclosure, a method for performing a task in an electronic device includes: detecting a deformation of at least a part of the electronic device; identifying information on a task which is performed in the electronic device; and restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task.

[0012] According to various example embodiments of the present disclosure, an electronic device includes: at least one sensor configured to detect a deformation of at least a part of the electronic device; a driver unit configured to restore the at least deformed part of the electronic device; and at least one processor electrically connected with the at least one sensor and the driver unit, and the processor configured to control the driver unit to detect a deformation of at least a part of the electronic device using the at least one sensor, to identify information on a task which is performed in the electronic device, and to restore the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The above and other aspects of the present disclosure and their attendant advantages, will be more readily understood and appreciated from the following detailed description, taken in conjunction with the accompanying drawings, in which like reference numerals refer to like elements, and wherein:

[0014] FIG. **1** is a diagram illustrating an example network environment including an electronic device according to various example embodiments of the present disclosure;

[0015] FIG. **2** is a block diagram illustrating an example electronic device according to various example embodiments of the present disclosure;

[0016] FIG. **3** is a block diagram illustrating an example program module according to various example embodiments;

[0017] FIGS. **4**A, **4**B, **4**C, **4**D, **5**A, **5**B, **6**A and **6**B are diagrams illustrating an example method for performing a task according to various example embodiments of the present disclosure;

[0018] FIG. **7** is a flowchart illustrating an example method for performing a task according to an example embodiment of the present disclosure;

[0019] FIG. **8** is a flowchart illustrating an example method for restoring at least a part of the electronic device according to an example embodiment of the present disclosure;

[0020] FIGS. **9**A and **9**B are diagrams illustrating an example method for restoring at least a part of the electronic device according to an example embodiment of the present disclosure;

[0021] FIGS. **10**A, **10**B and **10**C are diagrams illustrating an example method for restoring at least a part of the electronic device according to another example embodiment of the present disclosure;

[0022] FIGS. **11**A, **11**B, **12**A, **12**B, **13**A and **13**B are diagrams illustrating an example method for restoring at least a part of the electronic device according to still another example embodiment of the present disclosure;

[0023] FIG. **14** is a flowchart illustrating an example method for performing a task according to another example embodiment of the present disclosure;

[0024] FIGS. **15**A, **15**B, **15**C and **15**D are diagrams illustrating an example method for performing a task according to another example embodiment of the present disclosure;

[0025] FIGS. **16**A, **16**B, **16**C and **16**D are diagrams illustrating an example method for performing a task related to a timer function according to an example embodiment of the present disclosure;

[0026] FIGS. **17**A, **17**B and **17**C are diagrams illustrating an example method for performing a task related to an application update function according to an example embodiment of the present disclosure;

[0027] FIGS. **18**A, **18**B and **18**C are diagrams illustrating an example method for performing a task related file transmission according to an example embodiment of the present disclosure;

[0028] FIGS. **19**A, **19**B and **19**C are diagrams illustrating an example method for performing a task related to a charging function according to an example embodiment of the present disclosure; and

[0029] FIGS. **20**A, **20**B, **20**C, **20**D, **21**A, **21**B, **21**C, **21**D and **21**E are diagrams illustrating an example method for performing a task related to an automatic photographing function of a camera according to an example embodiment of the present disclosure.

DETAILED DESCRIPTION

[0030] Hereinafter, various example embodiments of the present disclosure will be described with reference to the accompanying drawings. However, it should be understood that there is no intent to limit the present disclosure to the various forms disclosed herein; rather, the present disclosure should be understood to cover various modifications, equivalents, and/or alternatives of the various example embodiments of the present disclosure. In describing the drawings, similar reference numerals may be used to designate similar constituent elements.

[0031] As used herein, the expression "have", "may have", "include", or "may include" refers to the existence of a corresponding feature (e.g., numeral, function, operation, or constituent element such as component), and does not exclude one or more additional features.

[0032] In the present disclosure, the expression "A or B", "at least one of A or/and B", or "one or more of A or/and B" may include all possible combinations of the items listed. For example, the expression "A or B", "at least one of A and B", or "at least one of A or B" refers to all of (1) including at least one A, (2) including at least one B, or (3) including both at least one A and at least one B.

[0033] The expression "a first", "a second", "the first", or "the second" used in various example embodiments of the present disclosure may modify various components regardless of the order and/or the importance but does not limit the corresponding components. For example, a first user device and a second user device indicate different user devices although both of them are user devices. For example, a first element may be termed a second element, and similarly, a second element may be termed a first element without departing from the scope of the present disclosure.

[0034] It should be understood that when an element (e.g., first element) is referred to as being (operatively or communicatively) "connected," or "coupled," to another element (e.g., second element), it may be directly connected or coupled directly to the other element or any other element (e.g., third element) may be interposed between them. On the other hand, it may be understood that when an element (e.g., first element) is referred to as being "directly connected," or "directly coupled" to another element (second element), there are no other elements (e.g., third element) interposed between them.

[0035] The expression "configured to" used in the present disclosure may be used interchangeably with, for example, "suitable for", "having the capacity to", "designed to", "adapted to", "made to", or "capable of" according to the situation. The term "configured to" may not necessarily imply "specifically designed to" in hardware. In some situations, the expression "device configured to" may refer, for example, to a situation in which the device, together with other devices or components, "is able to". For example, the phrase "processor adapted (or configured) to perform A, B, and C" may refer, for example, and without limitation, to a dedicated processor (e.g. embedded processor) only for performing the corresponding operations or a generic-purpose processor (e.g., central processing unit (CPU) or application processor (AP)) that can perform the corresponding operations by executing one or more software programs stored in a memory device.

[0036] The terms used herein are merely for the purpose of describing various example embodiments and are not intended to limit the scope of other embodiments. As used herein, singular forms may include plural forms as well unless the context clearly indicates otherwise. Unless defined otherwise, all terms used herein, including technical and scientific terms, have the same meaning as those commonly understood by a person skilled in the art to which the present disclosure pertains. Such terms as those defined in a generally used dictionary may be interpreted to have the meanings equal to the contextual meanings in the relevant field of art, and are not to be interpreted to have ideal or excessively formal meanings unless clearly defined in the present disclosure. In some cases, even if the term is defined in the present disclosure it should not be interpreted to exclude embodiments of the present disclosure.

[0037] An electronic device according to various example embodiments of the present disclosure may include at least one of, for example, a smart phone, a tablet Personal Computer (PC), a mobile phone, a video phone, an electronic book reader (e-book reader), a desktop PC, a laptop PC, a netbook computer, a workstation, a server, a Personal Digital Assistant (PDA), a Portable Multimedia Player (PMP), a MPEG-1 audio layer-3 (MP3) player, a mobile medical device, a camera, and a wearable device. According to various embodiments, the wearable device may include at least one of an accessory type (e.g., a watch, a ring, a bracelet, an anklet, a necklace, a glasses, a contact lens, or a Head-Mounted Device (HMD)), a fabric or clothing integrated type (e.g., an electronic clothing), a body-mounted type (e.g., a skin pad, or tattoo), and a bio-implantable type (e.g., an implantable circuit), or the like, but is not limited thereto.

[0038] According to some example embodiments, the electronic device may be a home appliance. The home appliance may include at least one of, for example, a television, a Digital Video Disk (DVD) player, an audio, a refrigerator, an air conditioner, a vacuum cleaner, an oven, a microwave oven, a washing machine, an air cleaner, a set-top box, a home automation control panel, a security control panel, a TV box (e.g., Samsung HomeSync™, Apple TV™, or Google TV™), a game console (e.g., Xbox™ and

PlayStation™), an electronic dictionary, an electronic key, a camcorder, and an electronic photo frame, or the like, but is not limited thereto.

[0039] According to another example embodiment, the electronic device may include at least one of various medical devices (e.g., various portable medical measuring devices (a blood glucose monitoring device, a heart rate monitoring device, a blood pressure measuring device, a body temperature measuring device, etc.), a Magnetic Resonance Angiography (MRA), a Magnetic Resonance Imaging (MRI), a Computed Tomography (CT) machine, and an ultrasonic machine), a navigation device, a Global Positioning System (GPS) receiver, an Event Data Recorder (EDR), a Flight Data Recorder (FDR), a Vehicle Infotainment Devices, an electronic devices for a ship (e.g., a navigation device for a ship, and a gyro-compass), avionics, security devices, an automotive head unit, a robot for home or industry, an automatic teller's machine (ATM) in banks, point of sales (POS) in a shop, or internet device of things (e.g., a light bulb, various sensors, electric or gas meter, a sprinkler device, a fire alarm, a thermostat, a streetlamp, a toaster, a sporting goods, a hot water tank, a heater, a boiler, etc.), or the like, but is not limited thereto.

[0040] According to some example embodiments, the electronic device may include at least one of a part of furniture or a building/structure, an electronic board, an electronic signature receiving device, a projector, and various kinds of measuring instruments (e.g., a water meter, an electric meter, a gas meter, and a radio wave meter), or the like, but is not limited thereto. The electronic device according to various example embodiments of the present disclosure may be a combination of one or more of the aforementioned various devices. The electronic device according to some example embodiments of the present disclosure may be a flexible device. Further, the electronic device according to an example embodiment of the present disclosure is not limited to the aforementioned devices, and may include a new electronic device according to the development of technology.

[0041] Hereinafter, an electronic device according to various example embodiments will be described with reference to the accompanying drawings. As used herein, the term "user" may indicate a person who uses an electronic device or a device (e.g., an artificial intelligence electronic device) that uses an electronic device.

[0042] FIG. **1** is a diagram illustrating an example electronic device in a network environment according to various example embodiments of the present disclosure.

[0043] An electronic device **101** within a network environment **100**, according to various example embodiments, will be described with reference to FIG. **1**. The electronic device **101** may include a bus **110**, a processor (e.g., including processing circuitry) **120**, a memory **130**, an input/output interface (e.g., including input/output circuitry) **150**, a display **160**, and a communication interface (e.g., including communication circuitry) **170**. In some example embodiments, the electronic device **101** may omit at least one of the above elements or may further include other elements.

[0044] The bus **110** may include, for example, a circuit for connecting the elements **110-170** and transferring communication (e.g., control messages and/or data) between the elements.

[0045] The processor **120** may include various processing circuitry, such as, for example, and without limitation, at least one or more of a dedicated processor, a Central Processing Unit (CPU), an Application Processor (AP), and a Communication Processor (CP). The processor **120**, for example, may carry out operations or data processing relating to control and/or communication of at least one other element of the electronic device **101**.

[0046] The memory **130** may include a volatile memory and/or a non-volatile memory. The memory **130** may store, for example, instructions or data relevant to at least one other element of the electronic device **101**. According to an example embodiment, the memory **130** may store software and/or a program **140**. The program **140** may include, for example, a kernel **141**, middleware **143**, an Application Programming Interface (API) **145**, and/or application programs (or "applications") **147**. At least some of the kernel **141**, the middleware **143**, and the API **145** may be referred to as an Operating System (OS).

[0047] The kernel **141** may control or manage system resources (e.g., the bus **110**, the processor **120**, or the memory **130**) used for performing an operation or function implemented by the other programs (e.g., the middleware **143**, the API **145**, or the application programs **147**). Furthermore, the kernel **141** may provide an interface through which the middleware **143**, the API **145**, or the application programs **147** may access the individual elements of the electronic device **101** to control or manage the system resources.

[0048] The middleware **143**, for example, may function as an intermediary for allowing the API **145** or the application programs **147** to communicate with the kernel **141** to exchange data.

[0049] In addition, the middleware **143** may process one or more operation requests received from the application program **147** based on priority. For example, the middleware **143** may give priority to use the system resources of the electronic device **101** (for example, the bus **110**, the processor **120**, the memory **130**, and the like) to at least one of the application programs **147**. For example, the middleware **143** may perform scheduling or load balancing with respect to the one or more operation requests by processing the one or more operation requests based on the priority given to the at least one application program.

[0050] The API **145** is an interface through which the applications **147** control functions provided from the kernel **141** or the middleware **143**, and may include, for example, at least one interface or function (e.g., instruction) for file control, window control, image processing, or text control.

[0051] The input/output interface **150**, for example, may include various input/output circuitry configured to function as an interface that may transfer instructions or data input from a user or another external device to the other element(s) of the electronic device **101**. Furthermore, the input/output interface **150** may output the instructions or data received from the other element(s) of the electronic device **101** to the user or another external device.

[0052] The display **160** may include, for example, a Liquid Crystal Display (LCD), a Light Emitting Diode (LED) display, an Organic Light Emitting Diode (OLED) display, a Micro Electro Mechanical System (MEMS) display, or an electronic paper display, or the like, but is not limited thereto. The display **160**, for example, may display various types of content (e.g., text, images, videos, icons, or symbols) for the user. The display **160** may include a touch screen and receive, for example, a touch, gesture, proximity, or hovering input using an electronic pen or the user's body part.

[0053] The communication interface **170**, for example, may include various communication circuitry configured to set communication between the electronic device **101** and an external device (e.g., the first external electronic device **102**, the second external electronic device **104**, or a server **106**). For example, the communication interface **170** may be connected to a network **162** through wireless or wired communication to communicate with the external device (e.g., the second external electronic device **104** or the server **106**). The wireless communication may use at least one of, for example, Long

[0054] Term Evolution (LTE), LTE-Advance (LTE-A), Code Division Multiple Access (CDMA), Wideband CDMA (WCDMA), Universal Mobile Telecommunications System (UMTS), WiBro (Wireless Broadband), and Global System for Mobile Communications (GSM), as a cellular communication protocol. In addition, the wireless communication may include, for example, short range communication **164**. The short-range communication **164** may be performed by using at least one of, for example, Wi-Fi, Bluetooth, Bluetooth low energy (BLE), Near Field Communication (NFC), and Global Navigation Satellite System (GNSS). The GNSS may include at least one of, for example, a Global Positioning System (GPS), a Global Navigation Satellite System (Glonass), a Beidou Navigation Satellite System (hereinafter referred to as "Beidou"), and a European Global Satellite-based Navigation System (Galileo), according to a use area, a bandwidth, or the like. Hereinafter, in the present disclosure, the "GPS" may be interchangeably used with the "GNSS". The wired communication may include at least one of, for example, a Universal Serial Bus (USB), a High Definition Multimedia Interface (HDMI), Recommended Standard 232 (RS-232), and a Plain Old Telephone Service (POTS). The network **162** may include at least one of a communication network such as a computer network (e.g., a LAN or a WAN), the Internet, and a telephone network.

[0055] Each of the first and second external electronic apparatuses **102** and **104 15** may be of a type identical to or different from that of the electronic apparatus **101**. According to an example embodiment, the server **106** may include a group of one or more servers. According to various example embodiments, all or some of the operations performed in the electronic device **101** may be performed in another electronic device or a plurality of electronic devices (e.g., the electronic devices **102** and **104** or the server **106**). According to an example embodiment, when the electronic device **101** has to perform some functions or services automatically or in response to a request, the electronic device **101** may make a request for performing at least some functions relating thereto to another device (e.g., the electronic device **102** or **104** or the server **106**) instead of performing the functions or services by itself or in addition. Another electronic apparatus may execute the requested functions or the additional functions, and may deliver a result of the execution to the electronic apparatus **101**. The electronic device **101** may process the received result as it is or additionally to provide the requested functions or services. To achieve this, for example, cloud computing, distributed computing, or client-server computing technology may be used.

[0056] FIG. **2** is a block diagram illustrating an example electronic device according to various example embodiments of the present disclosure.

[0057] FIG. **2** is a block diagram of an electronic device **201** according to various example embodiments. For example, the electronic apparatus **201** may include the whole or part of the electronic apparatus **101** illustrated in FIG. **1**. The electronic device **201** may include at least one processor (e.g., Application Processor (AP)) (e.g., including processing circuitry) **210**, a communication module (e.g., including communication circuitry) **220**, a Subscriber Identification Module (SIM) **224**, a memory **230**, a sensor module **240**, an input device (e.g., including input circuitry) **250**, a display **260**, an interface (e.g., including interface circuitry) **270**, an audio module **280**, a camera module **291**, a power management module **295**, a battery **296**, an indicator **297**, and a motor **298**.

[0058] The processor **210** may include various processing circuitry configured to control a plurality of hardware or software components connected to the processor **210** by driving an operating system or an application program and perform processing of various pieces of data and calculations. The processor **210** may be implemented by, for example, and without limitation, various processing circuitry (e.g., a dedicated processor, CPU, or the like) implemented as a System on Chip (SoC). According to an example embodiment, the processor **210** may further include a Graphic Processing Unit (GPU) and/or an image signal processor. The processor **210** may include at least some (e.g., a cellular module **221**) of the elements illustrated in FIG. **2**. The processor **210** may load, into a volatile memory, instructions or data received from at least one (e.g., a non-volatile memory) of the other elements and may process the loaded instructions or data, and may store various data in a non-volatile memory.

[0059] The communication module **220** may have a configuration equal or similar to that of the communication interface **170** of FIG. **1**. The communication module **220** may include various communication circuitry, such as, for example, and without limitation, at least one of the cellular module **221**, a Wi-Fi module **223**, a Bluetooth (BT) module **225**, a Bluetooth low energy (BLE) module **226**, a GNSS module **227** (e.g., a GPS module, a Glonass module, a Beidou module, or a Galileo module), an NFC module **228**, and a Radio Frequency (RF) module **229**.

[0060] The cellular module **221** may provide a voice call, image call, a text message service, or an Internet service through, for example, a communication network. According to an example embodiment, the cellular module **221** may distinguish between and authenticate electronic devices **201** within a communication network using a subscriber identification module (for example, the SIM card **224**). According to an example embodiment of the present disclosure, the cellular module **221** may perform at least some of the functions that the processor **210** may provide. According to an example embodiment, the cellular module **221** may include a Communication Processor (CP).

[0061] Each of the Wi-Fi module **223**, the BT module **225**, the Bluetooth low energy module **226**, the GNSS module **227**, and the NFC module **228** may include, for example, a processor for processing data transmitted and received through the relevant module. According to some example embodiments of the present disclosure, at least some (e.g., two or more) of the cellular module **221**, the Wi-Fi module

223, the BT module 225, the GNSS module 227, and the NFC module 228 may be included in one Integrated Chip (IC) or IC package.

[0062] The RF module 229 may transmit/receive, for example, a communication signal (for example, an RF signal). The RF module 229 may include, for example, a transceiver, a Power Amplifier Module (PAM), a frequency filter, a Low Noise Amplifier (LNA), and an antenna. According to another embodiment of the present disclosure, at least one of the cellular module 221, the Wi-Fi module 223, the BT module 225, the Bluetooth low energy module 226, the GNSS module 227, and the NFC module 228 may transmit and receive RF signals through a separate RF module.

[0063] The subscriber identification module 224 may include, for example, a card including a subscriber identity module and/or an embedded SIM, and may contain unique identification information (e.g., an Integrated Circuit Card Identifier (ICCID)) or subscriber information (e.g., an International Mobile Subscriber Identity (IMSI)).

[0064] The memory 230 (for example, the memory 130) may include, for example, an internal memory 232 and/or an external memory 234. The embedded memory 232 may include at least one of a volatile memory (for example, a Dynamic Random Access Memory (DRAM), a Static RAM (SRAM), a Synchronous Dynamic RAM (SDRAM), and the like) and a non-volatile memory (for example, a One Time Programmable Read Only Memory (OTPROM), a Programmable ROM (PROM), an Erasable and Programmable ROM (EPROM), an Electrically Erasable and Programmable ROM (EEPROM), a mask ROM, a flash ROM, a flash memory (for example, a NAND flash memory or a NOR flash memory), a hard disc drive, a Solid State Drive (SSD), and the like).

[0065] The external memory 234 may further include a flash drive, for example, a Compact Flash (CF), a Secure Digital (SD), a Micro Secure Digital (Micro-SD), a Mini Secure Digital (Mini-SD), an eXtreme Digital (xD), a memory stick, or the like. The external memory 234 may be functionally and/or physically connected to the electronic apparatus 201 through various interfaces.

[0066] The sensor module 240 may measure a physical quantity or detect an operation state of the electronic device 201, and may convert the measured or detected information into an electrical signal. For example, the sensor module 240 may include at least one of a gesture sensor 240A, a gyro sensor 240B, an atmospheric pressure sensor 240C, a magnetic sensor 240D, an acceleration sensor 240E, a grip sensor 240F, a proximity sensor 240G, a color sensor 240H (for example, a Red/Green/Blue (RGB) sensor), a biometric sensor 2401, a temperature/humidity sensor 240J, a light sensor 240K, and an Ultra Violet (UV) sensor 240M. Additionally or alternatively, the sensor module 240 may include, for example, an E-nose sensor, an electromyography (EMG) sensor, an electroencephalogram (EEG) sensor, an electrocardiogram (ECG) sensor, an Infrared (IR) sensor, an iris sensor, and/or a fingerprint sensor. The sensor module 240 may further include a control circuit for controlling one or more sensors included therein. In some example embodiments of the present disclosure, the electronic apparatus 201 may further include a processor configured to control the sensor module 240 as a part of or separately from the processor 210, and may control the sensor module 240 while the processor 210 is in a sleep state.

[0067] The input device 250 may include various input circuitry, such as, for example, and without limitation, one or more of a touch panel 252, a (digital) pen sensor 254, a key 256, or an ultrasonic input device 258. The touch panel 252 5 may use at least one of, for example, a capacitive type, a resistive type, an infrared type, and an ultrasonic type. Also, the touch panel 252 may further include a control circuit. The touch panel 252 may further include a tactile layer and provide a tactile reaction to the user.

[0068] The (digital) pen sensor 254 may include, for example, a recognition sheet which is a part of the touch panel or is separated from the touch panel. The key 256 may include, for example, a physical button, an optical key or a keypad. The ultrasonic input device 258 may detect ultrasonic wavers generated by an input tool through a microphone (for example, a microphone 288) and identify data corresponding to the detected ultrasonic waves.

[0069] The display 260 (for example, the display 160) may include a panel 262, a hologram device 264 or a projector 266. The panel 262 may include a configuration that is identical or similar to the display 160 illustrated in FIG. 1. The panel 262 may be implemented to be, for example, flexible, transparent, or wearable. The panel 262 and the touch panel 252 may be implemented as one module. The hologram 264 may show a three dimensional image in the air by using an interference of light. The projector 266 may display an image by projecting light onto a screen. The screen may be located, for example, inside or outside the electronic apparatus 201. According to an example embodiment, the display 260 may further include a control circuit for controlling the panel 262, 25 the hologram device 264, or the projector 266.

[0070] The interface 270 may include various interface circuitry, such as, for example, and without limitation, one or more of a High-Definition Multimedia Interface (HDMI) 272, a Universal Serial Bus (USB) 274, an optical interface 276, or a D-subminiature (D-sub) 278. The interface 270 may be included in, for example, the communication interface 170 illustrated in FIG. 1. Additionally or alternatively, the interface 270 may include other interface circuitry, such as, for example, and without limitation, a Mobile High-definition Link (MHL) interface, a Secure Digital (SD) card/Multi-Media Card (MMC) interface, or an Infrared Data Association (IrDA) standard interface.

[0071] The audio module 280 may bilaterally convert, for example, a sound and an electrical signal. At least some elements of the audio module 280 may be included in, for example, the input/output interface 150 illustrated in FIG. 1. The audio module 280 may process sound information which is input or output through, for example, a speaker 282, a receiver 284, earphones 286, the microphone 288 or the like.

[0072] The camera module 291 is a device which may photograph a still image and a dynamic image. According to an example embodiment, the camera module 291 may include one or more image sensors (for example, a front sensor or a back sensor), a lens, an Image Signal Processor (ISP) or a flash (for example, LED or xenon lamp).

[0073] The power management module 295 may manage, for example, power of the electronic device 201. According to an example embodiment, the power management module 295 may include a Power Management Integrated Circuit (PMIC), a charger Integrated Circuit (IC), or a battery or fuel gauge. The PMIC may use a wired and/or wireless charging method. Examples of the wireless charging method may include, for example, a magnetic resonance method, a magnetic induction method, an electromagnetic method, and the like. Additional circuits (e.g., a coil loop, a resonance circuit, a rectifier, etc.) for wireless charging may be further included. The battery gauge may measure, for example, a residual quantity of the battery **296**, and a voltage, a current, or a temperature during the charging. The battery **296** may include, for example, a rechargeable battery or a solar battery.

[0074] The indicator **297** may display a particular state (e.g., a booting state, a message state, a charging state, or the like) of the electronic apparatus **201** or a part (e.g., the processor **210**). The motor **298** may convert an electrical signal into mechanical vibration, and may generate vibration, a haptic effect, or the like. Although not illustrated, the electronic apparatus **201** may include a processing unit (e.g., a GPU) for supporting a mobile television (TV). The processing unit for supporting mobile TV may, for example, process media data according to a certain standard such as Digital Multimedia Broadcasting (DMB), Digital Video Broadcasting (DVB), or mediaFLO™.

[0075] Each of the above-described component elements of hardware according to the present disclosure may be configured with one or more components, and the names of the corresponding component elements may vary based on the type of electronic device. The electronic device according to various example embodiments of the present disclosure may include at least one of the aforementioned elements. Some elements may be omitted or other additional elements may be further included in the electronic device. Also, some of the hardware components according to various example embodiments may be combined into one entity, which may perform functions identical to those of the relevant components before the combination.

[0076] According to various example embodiments, the electronic device **101** may further comprise a driver unit configured to restore the at least deformed part of the electronic device. For example, the driver unit may include at least one of hinge unit or an element (or a material) which expands or contracts by applying an external power to the electronic device **101**. According to various example embodiments, the element (or the material) which expands or contracts by applying an external power to the electronic device **101** may be embodied by ionic polymer-metal composite or shape memory alloys, or the like.

[0077] FIG. **3** is a block diagram illustrating an example program module according to various example embodiments of the present disclosure.

[0078] According to an example embodiment, the program module **310** (for example, the program **140**) may include an Operating System (OS) for controlling resources related to the electronic device (for example, the electronic device **101**) and/or various applications (for example, the application programs **147**) executed in the operating system. The operating system may be, for example, Android, iOS, Windows, Symbian, Tizen, Bada, or the like.

[0079] The program module **310** may include a kernel **320**, middleware **330**, an API **360**, and/or an application **370**. At least some of the program module **310** may be preloaded on the electronic apparatus, or may be downloaded from an external electronic apparatus (e.g., the electronic apparatus **102** or **104**, or the server **106**).

[0080] The kernel **320** (e.g., the kernel **141**) may include, for example, a system resource manager **321** and/or a device driver **323**. The system resource manager **321** may perform the control, allocation, retrieval, or the like of system resources. According to an example embodiment of the present disclosure, the system resource manager **321** may include a process manager, a memory manager, a file system manager, or the like. The device driver **323** may include, for example, a display driver, a camera driver, a Bluetooth driver, a shared memory driver, a USB driver, a keypad driver, a Wi-Fi driver, an audio driver, or an Inter-Process Communication (IPC) driver.

[0081] The middleware **330** may provide a function required by the applications **370** in common or provide various functions to the applications **370** through the

[0082] API **360** so that the applications **370** can efficiently use limited system resources within the electronic device. According to an example embodiment, the middleware **330** (for example, the middleware **143**) may include, for example, at least one of a runtime library **335**, an application manager **341**, a window manager **342**, a multimedia manager **343**, a resource manager **344**, a power manager **345**, a database manager **346**, a package manager **347**, a connectivity manager **348**, a notification manager **349**, a location manager **350**, a graphic manager **351**, and a security manager **352**.

[0083] The runtime library **335** may include a library module that a compiler uses in order to add a new function through a programming language while the applications **370** are being executed. The runtime library **335** may perform input/output management, memory management, the functionality for an arithmetic function, or the like.

[0084] The application manager **341** may manage, for example, the life cycle of at least one of the applications **370**. The window manager **342** may manage Graphical User Interface (GUI) resources used for the screen. The multimedia manager **343** may determine a format required to reproduce various media files, and may encode or decode a media file by using a coder/decoder (codec) appropriate for the relevant format. The resource manager **344** may manage resources, such as a source code, a memory, a storage space, and the like of at least one of the applications **370**.

[0085] The power manager **345** may operate together with a Basic Input/Output System (BIOS) to manage a battery or power and may provide power information required for the operation of the electronic device. The database manager **346** may generate, search for, and/or change a database to be used by at least one of the applications **370**. The package manager **347** may manage the installation or update of an application distributed in the form of a package file.

[0086] The connectivity manager **348** may manage a wireless connection such as, for example, Wi-Fi or Bluetooth. The notification manager **349** may display or notify of an event, such as an arrival message, an appointment, a proximity notification, and the like, in such a manner as not to disturb the user. The location manager **350** may manage location information of the electronic apparatus. The graphic manager **351** may manage a graphic effect, which is to be provided to the user, or a user interface related to the graphic effect. The security manager **352** may provide various security functions required for system security, user authentication, and the like. According to an embodiment of the present disclosure, when the electronic apparatus (e.g., the electronic apparatus **101**) has a telephone call function, the middleware **330** may further include a telephony manager for managing a voice call function or a video call function of the electronic apparatus.

[0087] The middleware **330** may include a middleware module that forms a combination of various functions of the above-described elements. The middleware **330** may provide a module specialized for each type of OS in order to provide a differentiated function. Also, the middleware **330** may dynamically delete some of the existing elements, or may add new elements.

[0088] The API **360** (e.g., the API **145**) is, for example, a set of API programming functions, and may be provided with a different configuration based on an OS. For example, in the case of Android or iOS, one API set may be provided for each platform. In the case of Tizen, two or more API sets may be provided for each platform.

[0089] The applications **370** (for example, the application program **147**) may include, for example, one or more applications which can provide functions such as home **371**, dialer **372**, SMS/MMS **373**, Instant Message (IM) **374**, browser **375**, camera **376**, alarm **377**, contacts **378**, voice dialer **379**, email **380**, calendar **381**, media player **382**, album **383**, clock **384**, health care (for example, measure exercise quantity or blood sugar), or environment information (for example, atmospheric pressure, humidity, or temperature information).

[0090] According to an example embodiment of the present disclosure, the applications **370** may include an application (hereinafter, referred to as an "information exchange application" for convenience of description) supporting information exchange between the electronic apparatus (e.g., the electronic apparatus **101**) and an external electronic apparatus (e.g., the electronic apparatus **102** or **104**). The application associated with information exchange may include, for example, a notification relay application for forwarding specific information to an external electronic device, or a device management application for managing an external electronic device.

[0091] For example, the notification relay application may include a function of delivering, to the external electronic apparatus (e.g., the electronic apparatus **102** or **104**), notification information generated by other applications (e.g., an SMS/MMS application, an email application, a health care application, an environmental information application, etc.) of the electronic apparatus **101**. **25** Further, the notification relay application may receive notification information from, for example, an external electronic device and provide the received notification information to a user.

[0092] The device management application may manage (for example, install, delete, or update), for example, a function for at least a part of the external electronic device (for example, the electronic device **102** or **104**) communicating with the electronic device (for example, turning on/off the external electronic device itself (or some elements thereof) or adjusting brightness (or resolution) of a display), applications executed in the external electronic device, or services provided from the external electronic device (for example, a telephone call service or a message service).

[0093] According to an example embodiment, the applications **370** may include applications (for example, a health care application of a mobile medical appliance or the like) designated according to attributes of the external electronic device **102** or **104**. According to an example embodiment of the present disclosure, the application **370** may include an application received from the external electronic apparatus (e.g., the server **106**, or the electronic apparatus **102** or **104**). According to an embodiment of the present disclosure, the application **370** may include a preloaded application or a third party application which can be downloaded from the server. Names of the elements of the program module **310**, according to the above-described example embodiments of the present disclosure, may change depending on the type of OS.

[0094] According to various example embodiments of the present disclosure, at least some of the program module **310** may be implemented in software, firmware, hardware, or a combination of two or more thereof. At least some of the program module **310** may be implemented (e.g., executed) by, for example, the processor (e.g., the processor **210**). At least some of the program module **310** may include, for example, a module, a program, a routine, a set of instructions, and/or a process for performing one or more functions.

[0095] The term "module" as used herein may, for example, refer to a unit including one of hardware, software, and firmware or a combination of two or more of them. The "module" may be interchangeably used with, for example, the term "unit", "logic", "logical block", "component", or "circuit". The "module" may be a minimum unit of an integrated component element or a part thereof. The "module" may be a minimum unit for performing one or more functions or a part thereof. The "module" may be mechanically or electronically implemented. For example, the "module" according to the present disclosure may include, for example, and without limitation, at least one of a dedicated processor, a CPU, an Application-Specific Integrated Circuit (ASIC) chip, a Field-Programmable Gate Arrays (FPGA), and a programmable-logic device for performing operations which has been known or are to be developed hereinafter.

[0096] The module or the program module, according to various example embodiments, may: include one or more elements described above; exclude some of them; or further include other elements. The operations performed by the module, the program module, or other elements, according to various example embodiments, may be executed in a sequential, parallel, iterative, or heuristic method. In addition, some operations may be executed in a different order, or may be omitted, or other operations may be added. In addition, the embodiments disclosed in the present disclosure are intended for the explanation and understanding of the technical matter, and shall not limit the scope of the technology described in the present disclosure. Accordingly, the scope of the present disclosure should be construed to encompass all modifications or various other embodiments based on the technical concept of the present disclosure.

[0097] In addition, the example embodiments disclosed in the present disclosure are intended for the explanation and understanding of the disclosed technical matter, and shall not limit the scope of various example embodiments of the present disclosure. Therefore, the scope of various example embodiments of the present disclosure should be understood to encompass all modifications or various other embodiments based on the technical concept of the various embodiments of the present disclosure.

[0098] According to various example embodiments of the present disclosure, an electronic device may include: at least one sensor configured to detect a deformation of at least a part of the electronic device; a driver unit configured to restore the at least deformed part of the electronic device;

and at least one processor electrically connected with the at least one sensor and the driver unit, and the processor may be configured to control the driver unit to detect a deformation of at least a part of the electronic device using the at least one sensor, to identify information on a task which is performed in the electronic device, and to restore the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task.

[0099] In an example embodiment, the processor may detect at least one of bending, folding, and rolling of the at least a part of the electronic device using the at least one sensor.

[0100] In an example embodiment, the processor may determine whether the task is a task which is designated for restoring the at least a part of the electronic device or not, and the task designated for restoring the at least a part of the electronic device may include a task for which a task performance time is determined when the task is started.

[0101] In an example embodiment, the task designated for restoring the at least a part of the electronic device may include a task related to a timer function, a task related to an application update, a task related to file transmission, a task related to file download, a task related to an automatic photographing function of a camera, and a task related to a charging function.

[0102] In an example embodiment, the processor may determine whether it is possible to perform the task designated for restoring the at least a part of the electronic device, and, when it is determined that it is possible to perform the task designated for restoring the at least a part of the electronic device, may start performing the task designated for restoring the at least a part of the electronic device.

[0103] In an example embodiment, the processor may determine whether to restore the at least a part of the electronic device from which the deformation is detected based on at least the identified information of the task, when it is determined that the at least a part of the electronic device from which the deformation is detected is restored, the processor may restore the at least a part of the electronic device from which the deformation is detected by performing the task; and when it is determined that the at least a part of the electronic device from which the deformation is detected is not restored, the processor may perform the task while maintaining the deformation of the at least a part of the electronic device.

[0104] In an example embodiment, the processor may detect that the at least a part of the electronic device is deformed to form a predetermined angle using the at least one sensor, and may identify a task performance time which remains until the identified task is completed at a specified timer interval, may determine whether a change rate of the task performance time remaining until the identified task is completed is constant or not, may determine an angle per unit time for restoring the at least a part of the electronic device from which the deformation is detected, when the change rate of the task performance time remaining until the identified task is completed is constant, may restore the at least a part of the electronic device from which the deformation is detected from the predetermined angle at an equiangular velocity, and, when the change rate of the task performance time remaining until the identified task is completed is variable, may restore the at least a part of the electronic device from which the deformation is detected from the predetermined angle at a variable angular velocity.

[0105] In an example embodiment, the processor may determine whether the determined angle per unit time is greater than or equal to a specified angle, when the determined angle per unit time is greater than or equal to the specified angle, the processor may restore the at least a part of the electronic device by the determined angle per unit time; and, when the determined angle per unit time is less than the specified angle, may stop restoring the at least a part of the electronic device until the determined angle per unit time is equal to the specified angle, and may restore the at least a part of the electronic device from a time when the determined angle per unit time is equal to the specified angle.

[0106] In an example embodiment, after detecting the deformation of the at least a part of the electronic device, the processor may determine whether to restore the at least a part of the electronic device based on whether there is a user input or a movement of the electronic device.

[0107] In an example embodiment, the processor may set a performance time of the task as a fixed time based on at least the deformation of the at least a part of the electronic device, or may set the performance time of the task based on at least one of a degree of deformation of the at least a part of the electronic device, a number of times the at least a part of the electronic device is deformed, and a time during which a user contacts the at least a part of the electronic device.

[0108] FIGS. **4**A, **4**B, **4**C, **4**D, **5**A, **5**B, **6**A and **6**B are diagrams illustrating an example method for performing a task according to various example embodiments of the present disclosure.

[0109] Referring to FIGS. **4**A to **6**B, in an example embodiment, the electronic device **101** may be a flexible electronic device **101**. For example, the electronic device **101** may be a flexible electronic device having at least one inner configuration, for example, a housing, a display, a substrate including a circuit for driving the electronic device, deformed flexibly (or like paper).

[0110] In an example embodiment, the electronic device **101** may be deformed into a bent shape, a folded shape, or a rolled shape. For example, at least a part of the electronic device **101** may be bent by an external pressure (for example, a user input) or inner driving (for example, power supply to an inner configuration which is deformed when power is supplied). In another example, a state in which at least a part of the electronic device **101** is bent by more than a specified angle based on the degree of bending of the electronic device may be defined as a folded state. In still another example, a state in which at least some regions (or areas) of the electronic device **101** are bent by more than designated regions (or areas) may be defined as a rolled state. However, the definition of the deformed shape of the electronic device **101** is not limited to this. For example, the electronic device **101** may be deformed into various shapes having flexibility in addition to the bent (or crooked), folded, or rolled shape.

[0111] In an example embodiment, the electronic device **101** may restore the at least deformed part by performing a designated task in the state in which the at least a part of the electronic device **101** is deformed. In an example embodiment, the electronic device **101** may have at least a part thereof deformed by a user input (or a pressure or force). For example, at least a part of the electronic device **101** may be bent, folded, or rolled by a user. In an example embodiment, when a timer function is performed by a user input with at least a part of the electronic device **101** being deformed, the electronic device **101** may restore the at least deformed part of the electronic device **101** by performing a task related to the timer function. For example, as a time set in the timer function passes (or by reflecting the elapsed time), the electronic device **101** may restore the at least deformed part of the electronic device **101**.

[0112] In an example embodiment, FIGS. **4**A to **4**D illustrate an example of restoring at least a deformed part of the electronic device **101** by performing a designated task in a state in which the at least a part of the electronic device **101** is bent. In an example embodiment, the electronic device **101** may include a hinge unit **410** comprising a hinge for folding or restoring at least a part of the electronic device **101**. For example, the electronic device **101** may have at least a part of the electronic device **101** folded or restored with reference to the hinge unit **410**. In an example embodiment, the electronic device **101** may include a plurality of hinge units and may be folded by various angles or restored by the plurality of hinge units. FIGS. **4**A to **4**D illustrate the electronic device **101** folded in one direction with reference to one hinge unit **410**. In another example embodiment, however, when the electronic device **101** includes an additional hinge unit disposed, for example, perpendicularly to the direction of the hinge unit **410** penetrating through the electronic device **101**, the electronic device **101** may be folded in a direction perpendicular to the folding direction of the electronic device **101** in FIGS. **4**A to **4**D. However, this should not be considered as limiting.

[0113] In an example embodiment, when at least a part of the electronic device **101** is folded by a predetermined angle by the user as illustrated in FIG. **4**B, the electronic device **101** may perform a restoring operation by performing a task designated for restoring.

[0114] In an example embodiment, the task designated for the restoring operation may include a task for which a task performance time is specified at the same time when the task is performed (or at the same when the task is started). The task performance time may vary based on a user setting or a task (for example, a type of task, a task characteristic). In another example embodiment, the task designated for the restoring operation may include a task which is scheduled to be completed when the task is started. In still another embodiment, the task designated for the restoring operation may include a task for which a task completion time is estimated (or calculated) when the task is started. For example, the task designated for the restoring operation may include at least one of a task related to a timer function, a task related to an application update, a task related to file transmission, a task related to a file download, a task related to an automatic photographing function of a camera, and a task related to a charging function. However, this should not be considered as limiting. In an example embodiment, the task designated for the restoring operation may be designated by a user input. For example, in the example of a function of executing a music file, the electronic device **101** may endlessly repeat a music file set based on a user setting or may play only a limited number of music files and end the playing. In an example embodiment, when a limited number of music files are set to be played and ended, a task performance time, for example, a time for plying the music file, is specified. Therefore, the playing the limited number of music files may correspond to the task designated for the restoring operation.

[0115] In an example embodiment, the electronic device **101** may perform the operation of restoring the at least folded part of the electronic device **101**, for example, the operation of unfolding, by performing the task designated for restoring. For example, the electronic device **101** may perform the operation of unfolding the at least folded part of the electronic device **101** based on a time required to perform the task designated for restoring or a performance speed of the task. For example, when the task is started with at least a part of the electronic device **101** being folded by an angle θ_1 as illustrated in FIG. **4**B, the at least a part of the electronic device **101** may be unfolded to form an angle θ_2, which is smaller than the angle θ_1, as illustrated in FIG. **4**C, as the task performance time passes. In another example, when the task is completed with the at least a part of the electronic device **101** being folded by the angle θ_2 as illustrated in FIG. **4**C, the electronic device **101** may be unfolded to be horizontal (or flat) with the ground as illustrated in FIG. **4**D.

[0116] In an example embodiment, when at least a part of the electronic device **101** is folded while the task designated for restoring is being performed, the electronic device **101** may unfold the at least folded part of the electronic device **101** based on a remaining time of the total task performance time. In another example embodiment, when the electronic device **101** detects that at least a part of the electronic device **101** is folded and determines that it is possible to perform the task designated for restoring, the electronic device **101** may unfold the at least folded part of the electronic device **101** at the same of starting performing the designated task. However, this should not be considered as limiting.

[0117] In an example embodiment, FIGS. **5**A and **5**B illustrate an example of restoring at least a part of the electronic device **101** by performing a designated task in a state in which the at least a part of the electronic device **101** is bent.

[0118] For example, as the performance time of the designated task passes in the state in which at least a part of the electronic device **101** is bent as illustrated in FIG. **5**A, the at least bent part of the electronic device **101** may be unbent as illustrated in FIG. **5**B. FIGS. **5**A and **5**B illustrate an example of at least a part of the electronic device **101** being bent with reference to the center of the electronic device **101**, but this should not be considered as limiting. For example, the at least a part of the electronic device **101** may be bent in various shapes.

[0119] In an example embodiment, FIGS. **6**A and **6**B illustrate an example of restoring at least a part of the electronic device **101** by performing a designated task in a state in which the at least a part of the electronic device **101** is rolled.

[0120] For example, as the performance time of the designated task passes in the state in which at least a part of the electronic device **101** is rolled as illustrated in FIG. **6**A, the at least rolled part of the electronic device **101** may be unrolled as illustrated in FIG. **6**B. In an example embodiment, the electronic device **101** may further include a receiver (not shown) to receive the at least rolled part of the electronic device **101** when the at least a part of the electronic device **101** is rolled, although it is not illustrated. When the electronic device **101** further includes the receiver, the at least a part of the electronic device **101** received in the receiver may be extended to the outside of the receiver by performing the designated task in the state in which the at least a part of the electronic device **101** is included (or received) in the receiver. However, this should not be considered as limiting.

[0121] FIG. **7** is a flowchart illustrating an example method for performing a task according to an example embodiment of the present disclosure.

[0122] Referring to FIG. **7**, in operation **701**, the electronic device (for example, the processor **120**) may detect a deformation of at least a part of the electronic device **101**.

[0123] In an example embodiment, the electronic device (for example, the processor **120**) may be a flexible electronic device which can have at least a part thereof deformed. For example, the electronic device **101** may include at least one inner configuration having a characteristic of being flexibly deformed (or like paper), for example, a housing, a display, a substrate including a circuit for driving the electronic device, or the like. In an example embodiment, at least a part of the electronic device may be deformed into a bent shape, a folded shape, or a rolled shape.

[0124] In an example embodiment, the electronic device (for example, the processor **120**) may detect a deformation of at least a part of the electronic device **101** using at least one sensor. In an example embodiment, the at least one sensor for detecting the deformation of the at least a part of the electronic device **101** may include various sensors such as a bend sensor, an acceleration sensor **240**E, a gyro sensor **240**B, a geomagnetic sensor, or the like. For example, the bend sensor may be disposed on at least one of a front surface and a rear surface of the display **160** of the electronic device, and may be implemented in various forms like an electric resistance type sensor using an electric resistance, a micro optical fiber sensor using a strain rate of an optical fiber, or the like. In another example, the acceleration sensor **240**E may detect a deformation of at least a part of the electronic device **101** by measuring acceleration and an acceleration direction of the at least a part of the electronic device **101**, which are changed when the at least a part of the electronic device **101** is deformed. In still another example, the gyro sensor **240**B may detect a deformation of at least a part of the electronic device **101** by measuring a rotation of the at least a part of the electronic device **101**. In yet another example, the geomagnetic sensor may detect a deformation of at least a part of the electronic device **101** by measuring an azimuth of the at least a part of the electronic device **101** using a 2-axis or 3-axis fluxgate. However, the sensor for detecting the deformation of the at least a part of the electronic device **101** is not limited to these sensors, and various sensors may be utilized. For example, the electronic device **101** may detect a deformation of at least a part of the electronic device **101** using an infrared sensor, an ultrasonic sensor, a proximity sensor, or the like.

[0125] In an example embodiment, operation **701** of detecting the deformation of the at least a part of the electronic device **101** may further include a process of obtaining information on the deformation of the at least a part of the electronic device **101** (for example, information on the degree of deformation), in addition to the process of detecting the deformation/non-deformation of the at least a part of the electronic device **101**. In another example, the process of obtaining the information on the deformation of the at least a part of the electronic device **101** may be included in a process of restoring the at least deformed part of the electronic device **101** in operation **705**, and the process of detecting only the deformation/non-deformation of the at least a part of the electronic device **101 20** may be included in the process of detecting the deformation of the at least a part of the electronic device in process **701**. However, this should not be considered as limiting.

[0126] In operation **703**, the electronic device (for example, the processor **120**) may identify information on a task which is being performed.

[0127] In an example embodiment, the electronic device (for example, the processor **120**) may identify information on a task which is being performed in the electronic device **101**. For example, the electronic device (for example, the processor **120**) may determine whether the task currently performed in the electronic device **101** is a task designated for restoring or not. In an example embodiment, the task designated for the restoring operation may include a task for which a task performance time is specified at the same time when the task is performed (or at the same when the task is started). The task performance time may vary based on a user setting or a task (for example, a type of task, a task characteristic). In another example embodiment, the task designated for the restoring operation may include a task which is scheduled to be completed when the task is started. In still another example embodiment, the task designated for the restoring operation may include a task for which a task completion time is estimated (or calculated) when the task is started. For example, the task designated for the restoring operation may include at least one of a task related to a timer function, a task related to an application update, a task related to file transmission, a task related to a file download, a task related to an automatic photographing function of a camera, and a task related to a charging function. However, this should not be considered as limiting. In an example embodiment, the task designated for the restoring operation may be designated by a user input. For example, in the case of a function of executing a music file, the electronic device **101** may endlessly repeat a music file set based on a user setting or may play only a limited number of music files and end the playing. When a limited number of music files are set to be played and ended, a task performance time, for example, a time for plying the music file, is specified. Therefore, the playing the limited number of music files may correspond to the task designated for the restoring operation.

[0128] In another example embodiment, the electronic device (for example, the processor **120**) may determine whether the electronic device **101** is in a state in which the task designated for restoring can be performed. For example, the electronic device (for example, the processor **120**) may determine whether the electronic device **101** is in a state in which the task designated for restoring is set to be performed in response to an input, for example, a deformation of the electronic device **101**. For example, in the case of the timer function, when time of the timer is set, the electronic device (for example, the processor **120**) may determine that the electronic device **101** is in the state in which the task designated for restoring can be performed. In another example, in the case of the file transmission, when a file to be transmitted by the user and a device (or location) to receive the file are selected, the electronic device (for example, the processor **120**) may determine that the electronic device **101** is in the state in which the designated task can be performed. However, this should not be considered as limiting.

[0129] In an example embodiment, when it is determined that the electronic device **101** is in the state in which the task designated for restoring can be performed, the electronic device (for example, the processor **120**) may start performing the task designated for restoring (or may trigger to perform the task designated for restoring). For example, when it is determined that time of the timer is set, the electronic device (for example, the processor **120**) may start performing the task to let the set time pass as the timer function is executed. In another example, when it is determined that the file to be transmitted by the user and the device (or location) to receive the file are selected, the electronic device (for example, the processor **120**) may start performing the task to transmit the file as the file transmission is executed.

[0130] In another example, when the electronic device (for example, the processor **120**) determines that the electronic device **101** is in the state in which the task designated for restoring can be performed, the electronic device **101** may start performing the designated task by receiving a user's input (for example, a touch input). However, this should not be considered as limiting

[0131] In an example embodiment, when it is determined that a plurality of tasks are performed in the electronic device (for example, the processor **120**), the electronic device **101** may identify information on a main task from among the plurality of tasks. For example, when the plurality of tasks are being performed in the electronic device **101**, the electronic device **101** may identify information on a task related to a function (for example, an application function or the like) which is being executed in a foreground). However, this should not be considered as limiting.

[0132] In operation **705**, the electronic device (for example, the processor **120**) may restore the at least a part of the electronic device **101** based on at least the identified information on the task.

[0133] In an example embodiment, when it is determined that the task which is being performed in the electronic device **101** is not the task designated for restoring in operation **703**, the electronic device (for example, the processor **120**) may continue to perform the task while maintaining the deformation of the at least a part of the electronic device (for example, the processor **120**). In another example, when it is determined that the task which is being performed in the electronic device **101** is the task designated for restoring in operation **703**, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** by performing the task.

[0134] The process of restoring the at least deformed part of the electronic device **101** by performing the task will be described in greater detail below with reference to FIGS. **8** to **13**B.

[0135] FIG. **8** is a flowchart illustrating an example method for restoring at least a part of the electronic device **101** according to an example embodiment of the present disclosure.

[0136] Referring to FIG. **8**, in operation **801**, the electronic device (for example, the processor **120**) may determine whether to restore at least a part of the electronic device **101** based on identified information on a task.

[0137] In an example embodiment, when it is determined that a task currently performed in the electronic device **101** is a task designated for restoring, the electronic device (for example, the processor **120**) may determine to restore the at least deformed part of the electronic device **101**. For example, when it is determined that at least one of a task related to a timer function, a task related to an application update function, a task related to a file transmission function, a task related to a file download function, a task related to an automatic photographing function of a camera, and a task related to a charging function is being currently performed, the electronic device (for example, the processor **120**) may determine to restore the at least deformed part of the electronic device **101**. However, the task for determining to restore is not limited to the above-mentioned examples.

[0138] In another example embodiment, when it is determined that the task designated for restoring can be performed in the electronic device **101** and the task designated for restoring is started, the electronic device (for example, the processor **120**) may determine to restore the at least deformed part of the electronic device **101**.

[0139] In an example embodiment, operation **801** of determining whether to restore the at least a part of the electronic device **101** may include a process of, after detecting a deformation of at least a part of the electronic device **101**, determining whether to restore the at least a part of the electronic device **101** based on whether there is a user input or a movement of the electronic device **101**. For example, when a deformation of at least a part of the electronic device **101** is detected and it is determined that the performed task is the task designated for restoring, the electronic device (for example, the processor **120**) may determine not to restore the at least a part of the electronic device **101** in response to a user's input (for example, a touch input, a movement of the electronic device **101**, or the like) or a movement of the electronic device **101** being detected. In an example embodiment, the user's input or the movement of the electronic device **101** being detected may indicate a case in which the user deforms at least a part of the electronic device **101** for the purpose of simply holding the electronic device **101**. In another example embodiment, the user's input or the movement of the electronic device **101** being detected may indicate a case in which at least a part of the electronic device **101** is deformed while a function other than performing the task for restoring is being performed (or is deformed for other purposes). For example, the user's input being detected may indicate a case in which a user's input for creating a message is detected when at least a part of the electronic device **101** is deformed. In another example, the movement of the electronic device **101** being detected may indicate a case in which the user deforms, for example, bends at least a part of the electronic device **101** in order to move the at least a part of the electronic device **101** closer to user's ear while performing the telephony function of the electronic device **101**.

[0140] When the electronic device (for example, the processor **120**) does not determine to restore the at least a part of the electronic device **101** in operation **803**, the electronic device (for example, the processor **120**) may perform the task with the at least a part of the electronic device **101** being deformed in operation **805**. For example, when it is determined that the task performed in the electronic device **101** is not the task designated for restoring, the electronic device (for example, the processor **120**) may perform the task with the at least a part of the electronic device **101** being deformed. In another example, when there is a user input or a movement of the electronic device **101** within a specified threshold time after the deformation of the at least a part of the electronic device **101** was detected, the electronic device (for example, the processor **120**) may continue performing the current task or perform a function corresponding to the user input or the movement of the electronic device **101** with the at least a part of the electronic device **101** being deformed. However, this should not be considered as limiting.

[0141] When the electronic device (for example, the processor **120**) determines to restore the at least a part of the electronic device **101** in operation **803**, the electronic device (for example, the processor **120**) may restore the at least a part of the electronic device **101** by performing the task in operation **807**.

[0142] In an example embodiment, the electronic device (for example, the processor **120**) may obtain information on the deformation of the at least a part of the electronic device **101**, for example, information on an angle which is formed by the deformation of the at least a part of the electronic device **101**. A method for obtaining the information on the deformation of the at least a part of the electronic device **101** will be described in greater detail below with reference to FIGS. **9**A and **9**B.

[0143] In an example embodiment, by performing the task designated for restoring, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101**. The operation of restoring the at least deformed part of the electronic device **101** by performing the task will be described in greater detail below with reference to FIGS. **10**A to **10**C.

[0144] In an example embodiment, the electronic device (for example, the processor **120**) may identify a remaining performance time of the designated task periodically while restoring the at least deformed part of the electronic device **101**. In an example embodiment, the electronic device (for example, the processor **120**) may periodically provide the result of performing the designated task or a notification on the completion of the task in various ways. For example, while performing the task related to the timer function or when completing the task, the electronic device (for example, the processor **120**) may provide a notification on the passing of time at specified intervals (for example, every one minute). The electronic device (for example, the processor **120**) may output at least one of a notification window display, a sound, haptic feedback, and light to provide the notification. However, this should not be considered as limiting. In an example embodiment, when at least a part of the electronic device **101** is deformed to form a certain angle, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** from the formed angle at an equiangular velocity or a variable angular velocity, according to whether a change rate of the remaining performance time of the task is constant or not. The operation of restoring the at least deformed part of the electronic device **101** from the formed angle at the equiangular velocity or the variable angular velocity based on whether the change rate of the remaining performance time of the task is constant or not will be described in greater detail below with reference to FIGS. **11**A and **11**B and FIGS. **12**A and **12**B.

[0145] In an example embodiment, in a state in which at least a part of the electronic device **101** is deformed to form a certain angle, when an angle restored per unit time is less than or equal to a specified angle, the electronic device **101** may stop restoring until the angle restored per unit time is equal to the specified angle, and may restore by the specified angle per unit time from the time when the angle restored per unit time is equal to the specified angle. The operation of stopping restoring during a predetermined time and then restoring by comparing the angle restored per unit time and the specified angle per unit time will be described in greater detail below with reference to FIGS. **13**A and **13**B.

[0146] FIGS. **9**A and **9**B are diagrams illustrating an example method for restoring at least a part of the electronic device **101** according to an example embodiment of the present disclosure. FIGS. **9**A and **9**B are diagrams illustrating an example process of the electronic device (for example, the processor **120**) obtaining deformation information of at least a part of the electronic device **101**.

[0147] As illustrated in FIG. **9**A, the electronic device **101** may include a plurality of bend sensors **911** to **915** and **921** to **925** for obtaining deformation information of at least a part of the electronic device **101**. In an example embodiment, each of the plurality of bend sensors **911** to **915** and **921** to **925** of FIG. **9**A may be implemented using, for example, a resistance type sensor. However, this should not be considered as limiting. For example, each of the plurality of bend sensors **911** to **915** and **921** to **925** may be implemented using a micro optical fiber sensor using a strain rate of an optical fiber.

[0148] In an example embodiment, the electronic device (for example, the processor **120**) may obtain deformation information of at least a part of the electronic device **101** using the plurality of bend sensors **911** to **915** and **921** to **925**. In an example embodiment, information on a deformation of at least a part of the electronic device **101** may include information on at least one of a location of a deformed part, a degree of deformation (for example, a deformation angle), a direction of deformation, a deformation speed, the number of times of deformation, the number of deformed locations. However, this should not be considered as limiting.

[0149] In an example embodiment, when the electronic device **101** is bent such that its center faces downwards with reference to both right and left edges of the electronic device **101**, tension may be applied to the bend sensors **921** to **925** arranged in a horizontal direction. In an example embodiment, the bend sensors **921** to **925** arranged in the horizontal direction may obtain tension applied to the bend sensors **921** to **925** arranged in the horizontal direction, and may output resistance values based on the obtained tension. In one embodiment, the electronic device (for example, the processor **120**) may obtain information on at least one of a location of a deformed part, a degree of deformation (for example, a deformation angle), a deformation speed, the number of times of deformation, and the number of deformed locations based on the resistance values output from the bend sensors **921** to **925** arranged in the horizontal direction. For example, the electronic device (for example, the processor **120**) may obtain information on a location of a deformed part of the electronic device **101**, a degree of deformation (for example, a deformation angle), and the number of deformed locations based on the sizes of the resistance values output from the bend sensors **921** to **925**

arranged in the horizontal direction. In another example, the electronic device (for example, the processor **120**) may obtain information on a direction of deformation based on signs of the resistance values output from the bend sensors **921** to **925** arranged in the horizontal direction. In still another example, when at least a part of the electronic device **101** is continuously deformed, the electronic device (for example, the processor **120**) may obtain information on a deformation speed and the number of times of deformation based on information on a difference in the resistance values continuously output by the plurality of bend sensors. Although FIG. **9**A illustrates the electronic device **101** bent such that its center faces downward with reference to both right and left edges in an example embodiment, it would be apparent to a person skilled in the art that the information on the deformation is obtained in the same way or a similar way when the electronic device **101** is bent such that its center faces downward or upwards with reference to both upper and lower edges.

[0150] In an example embodiment, as illustrated in FIG. **9**B, the electronic device **101** may include a plurality of acceleration sensors **931** and **933** to obtain information on a deformation of at least a part of the electronic device **101**. In an example embodiment, the plurality of acceleration sensors **931** and **933** may output gravity acceleration which changes in response to at least a part of the electronic device **101** being bent. In one embodiment, the electronic device **101** may obtain information on a pitch angle and a roll angle based on at least information on the gravity acceleration outputted by the plurality of acceleration sensors **931** and **933**.

[0151] Although FIGS. **9**A and **9**B illustrate the bend sensors and the acceleration sensors **240**E as sensors for obtaining the information on the deformation of the at least a part of the electronic device **101**, this should not be considered as limiting. For example, the electronic device (for example, the processor **120**) may obtain the information on the deformation of the at least a part of the electronic device **101** using various sensors such as a gyro sensor **240**B and a geomagnetic sensor. For example, the electronic device **101** may obtain the information on the deformation of the at least a part of the electronic device **101** by measuring the rotation of the at least a part of the electronic device **101** using the gyro sensor **240**B. In another example, the electronic device (for example, the processor **120**) may detect the deformation of the at least a part of the electronic device **101** by measuring the azimuth of the at least a part of the electronic device **101** using a 2-axis or 3-axis fluxgate using the geomagnetic sensor. In still another example, the electronic device **101** may obtain the information on the deformation of the at least a part of the electronic device **101** using an infrared sensor, an ultrasonic sensor **240**M, or a proximity sensor **240**G.

[0152] FIGS. **9**A and **9**B illustrate an example in which at least a part of the electronic device **101** is bent, but this should not be considered as limiting. For example, when at least a part of the electronic device **101** is folded, information on a deformation may be obtained in the same way or similar way as or to that of the example embodiment of FIGS. **9**A and **9**B.

[0153] In an example embodiment, when at least a part of the electronic device **101** is rolled, the electronic device (for example, the processor **120**) may obtain information on at least one of the location of the rolled part of the electronic device **101** and roll information (for example, the area (or size) of the rolled part). For example, when the electronic device **101** includes a plurality of bend sensors, the electronic device **101** may obtain the information of at least one of the location of the rolled part and the roll information (for example, the area (or size) of the rolled part) by determining a difference between a resistance value outputted from the bend sensor arranged in the rolled part of the electronic device **101** and a resistance value outputted from the bend sensor arranged in the unrolled part (for example, a flat part). In another example, the electronic device (for example, the processor **120**) may obtain the information on at least one of the location of the rolled part of the electronic device **101** and the roll information (for example, the area (or size) of the rolled part) using a line or an area where the rolled part of the electronic device **101** is brought into contact with the unrolled part. For example, the electronic device (for example, the processor **120**) may obtain the information on at least one of the location of the rolled part and the roll information (for example, the area (or size) of the rolled part) by detecting the line where the rolled part of the electronic device **101** is brought into contact with the unrolled part, and then distinguishing between the rolled part and the unrolled part with reference to the detected line.

[0154] FIGS. **10**A, **10**B and **10**C are diagrams illustrating an example method for restoring at least a part of the electronic device **101** according to another example embodiment of the present disclosure.

[0155] In an example embodiment, the electronic device (for example, the processor **120**) may restore at least a deformed part of the electronic device **101** by performing a task designated for restoring.

[0156] For example, FIG. **10**A illustrates a state in which a part **101-1** of the electronic device **101** is laid horizontally on the ground and the other part **101-3** of the electronic device **101** is folded with reference to a hinge unit **1010**. In an example embodiment, by performing a designated task in the electronic device **101**, the electronic device (for example, the processor **120**) may restore (or rotate) the part **101-3** of the electronic device **101** using the hinge unit **1010** in the direction of an arrow. In another example embodiment, the electronic device (for example, the processor **120**) may restore (or rotate) the part **101-3** of the electronic device **101** in the direction of the arrow based on a performance time of the designated task. In still another example embodiment, the electronic device (for example, the processor **120**) may restore (or rotate) the part **101-3** of the electronic device **101** in the direction of the arrow based on a performance speed of the designated task (or a change rate of a remaining performance time of the task) which is measured periodically (for example, every 1 minute) in the electronic device **101**. However, this should not be considered as limiting.

[0157] In an example embodiment, FIG. **10**A illustrates an example in which the electronic device **101** includes one hinge unit **101** and is deformed or restored with reference to the hinge unit **1010**. However, when the electronic device **101** includes a plurality of hinge units, the electronic device **101** may be deformed or restored in various directions (or by various angles).

[0158] In another example, the electronic device **101** may include a configuration (or a driving unit or an actuator) to deform or restore a part of the electronic device **101**. For example, the configuration for deforming or restoring a part of the electronic device **101** may include an element or material which contracts or expands based on a power supplied from an external power source. For example, the configuration for deforming or restoring a part of the electronic device **101** may be implemented using an ionic polymer-metal composite or shape memory alloys which contract or expand according to power supply from the external power source. However, this should not be considered as limiting.

[0159] In an example embodiment, FIG. **10**B illustrates the electronic device **101** in which a configuration for deforming or restoring a part of the electronic device **101** includes a plurality of cells **1021**, **1023**, **1025** and **1027**. In an example embodiment, at least one cell **1025**, **1027** of the plurality of cells **1021**, **1023**, **1025** and **1027** may be deformed or restored in the direction of an arrow based on power supply as illustrated in FIG. **10**B. In an example embodiment, the electronic device **101** may restore the at least deformed part of the electronic device **101** by adjusting voltage supply to the at least one deformed cell **1025**, **1027** from among the plurality of cells **1021**, **1023**, **1025** and **1027** of the electronic device **101** by performing a task designated for restoring. In another example embodiment, the electronic device **101** may restore the at least deformed part of the electronic device **101** by adjusting voltage supply (or a level of a voltage) to the at least one deformed cell **1025**, **1027** from among the plurality of cells **1021**, **1023**, **1025** and **1027** of the electronic device **101** based on the performance time of the designated task. In still another example embodiment, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** by adjusting voltage supply to the at least one deformed cell **1025**, **1027** from among the plurality of cells **1021**, **1023**, **1025** and **1027** of the electronic device **101** based on the performance speed of the designated task which is measured in the electronic device **101** periodically (for example, every 1 minute). However, this should not be considered as limiting.

[0160] In an example embodiment, FIG. **10**C illustrates a view explaining a process of the electronic device (for example, the processor **120**) restoring at least a part of the electronic device **101** by performing a task designated for restoring in a state in which the at least a part of the electronic device is rolled. When at least a part of the electronic device **101** is rolled as illustrated in FIG. **10**C, the electronic device (for example, the processor **120**) may obtain information on at least one of the location of the rolled part of the electronic device **101** and roll information (for example, an area (or size) of the rolled part), that is, information on the at least deformed part of the electronic device **101**. For example, the electronic device (for example, the processor **120**) may obtain the information on at least one of the location of the rolled part of the electronic device **101** and the roll information (for example, the area (or size) of the rolled part) using a line connecting points **1030** where the rolled part and the unrolled part of the electronic device **101** are brought in contact with each other (or with reference to the line). In an example embodiment, the electronic device (for example, the processor **120**) may restore the at least rolled part of the electronic device **101** by performing the task designated for restoring. For example, the electronic device **101** may include the hinge unit **1010** of FIG. **10**A or the configuration for deforming or restoring a part of the electronic device **101** as illustrated in FIG. **10**B. The electronic device (for example, the processor **120**) may restore the at least rolled part of the electronic device **101** by performing the task using the hinge unit **1010** or the configuration for deforming or restoring a part of the electronic device **101**. In another example, the electronic device (for example, the processor **120**) may restore the at least rolled part of the electronic device **101** based on the performance time of the designated task in the electronic device **101** using the hinge unit **1010** or the configuration for deforming or restoring a part of the electronic device **101**. In still another example, the electronic device (for example, the processor **120**) may restore the at least rolled part of the electronic device **101** based on the performance speed of the designated task, which is measured in the electronic device **101** periodically (for example, every 1 minute), using the hinge unit **1010** or the configuration for deforming or restoring a part of the electronic device **101**.

[0161] FIGS. **11**A, **11**B, **12**A, **12**B, **13**A and **13**B are diagrams illustrating an example method for restoring at least a part of the electronic device **101** according to still another example embodiment of the present disclosure.

[0162] In an example embodiment, the electronic device (for example, the processor **120**) may adjust a degree of restoring the at least deformed part of the electronic device **101** based on whether a task performance time remaining until the task is completed is regularly (or equally) changed (or whether a change rate of the task performance time is constant or not), while performing the task designated for restoring.

[0163] For example, when the task performance time remaining until the task is completed is regularly changed at a time interval of **1**t as illustrated in FIG. **11**A, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** by an angel of x° at a time (for example, at an equiangular velocity). For example, when a part of the electronic device **101** is folded by 140° as illustrated in FIG. **11**B and the total performance time of the task is determined (or estimated or scheduled) as 20 minutes, the electronic device (for example, the processor **120**) may restore the at least folded part of the electronic device **101** by an angle of 7° per unit time, for example, per minute. For example, when 5 minutes of the task performance time passes as illustrated in FIG. **11**B, the electronic device (for example, the processor **120**) may restore the at least folded part of the electronic device **101** by an angle of 35°. In an example embodiment, the example in which the task performance time remaining until the task is completed is regularly changed while the task is being performed may be an example in which the task related to the timer function is performed.

[0164] In another example, FIG. **12**A illustrates an example in which the task performance time remaining until the task is completed is variably changed. For example, when the task related to the file transmission function is performed, a file transmission end time (or a file transmission speed or the like) may be changed variably based on a factor such as a communication environment or the like, and accordingly, the time required to perform the task related to the file transmission is also variable until the task related to the file transmission is completed. In an example embodiment, the electronic device (for example, the processor **120**) may measure (or calculate) the remaining task performance time periodically (or at a regular time interval), and may restore the at least deformed part of the electronic device **101** based on the measured remaining task performance time.

For example, as illustrated in FIG. **12**A, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** by an angle of x° from time **0** until time **1**t, consider the remaining task performance time at time **1**t, and restore the at least deformed part of the electronic device **101** by an angle of 3x° from time **1**t until time **2**t. For example, the electronic device (for example, the processor **120**) may consider the remaining task performance time at times **2**t, **3**t, and **4**t, and may restore the at least deformed part of the electronic device **101** by the angle of x° from time **2**t until time **3**t, by an angle of 2x° from time **3**t until time **4**t, and by the angle of x° from time **4**t until time **5**t. However, this should not be considered as limiting. In an example embodiment, when at least a part of the electronic device **101** is folded by 140° and the total performance time of the task is determined (estimated or scheduled) as 20 minutes as illustrated in FIGS. **11**A and **11**B, and when 3 minutes of the task performance time passes, the electronic device (for example, the processor **120**) may restore the at least folded part of the electronic device **101** by 35° corresponding to 5x°.

[0165] In an example embodiment, FIGS. **13**A and **13**B illustrate an example of the electronic device (for example, the processor **120**) restoring the at least deformed part of the electronic device **101** by determining whether a restoring angle determined per unit time is greater than or equal to a specified angle or not.

[0166] For example, when a specified angle is an angle of 5° per minute, at least a part of the electronic device **101** is folded by 140°, the task performance time is determine as 20 minutes in FIG. **13**A, the electronic device (for example, the processor **120**) may determine a restoring angle per minute as 7°. The electronic device (for example, the processor **120**) may determine that the determined restoring angle per minute, 7°, is greater than the specified angle 5°. When the determined restoring angle per minute is greater than the specified angle, the electronic device **101** may restore the at least folded part of the electronic device **101** by the determined restoring angle per minute.

[0167] In another example, when the specified angle is an angle of 5° per minute, at least a part of the electronic device **101** is bent by 40°, the task performance time is determined as 20 minutes in FIG. **13**B, the electronic device **101** may determine a restoring angle per minute as 2°. The electronic device (for example, the processor **120**) may determine that the determined restoring angle per minute, 2°, is less than the specified angle 5°. In an example embodiment, when the determined restoring angle per minute is less than the specified angle, the electronic device (for example, the processor **120**) may stop restoring until the restoring angle per minutes is equal to the specified angle. In an example embodiment, in the state in which the electronic device (for example, the processor **120**) stops restoring, when the restoring angle per minute is equal to the specified angle, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** by the specified angle per minute. In an example embodiment, the electronic device (for example, the processor **120**) may determine a time at which the restoring angle per minute is equal to the specified angle according to following Equation 1:

$$\frac{a}{t-k} = c \qquad \text{Equation 1}$$

[0168] where a is a deformation angle, t is the total task performance time, c is a specified angle per unit time, and k is a time at which the restoring angle per minute is equal to the specified angle.

[0169] For example, when at least a part of the electronic device **101** is deformed by 40°, the total task performance time is 20 minutes, and the specified angle per minute is 5°, the electronic device **101** may determine the time at which the restoring angle per minute is equal to the specified angle as 12 minutes. In an example embodiment, the electronic device (for example, the processor **120**) may stop restoring the at least deformed part of the electronic device **101** during 8 minutes out of the total task performance time of 20 minutes, and may restore the at least deformed part of the electronic device **101** by 5° per minute during remaining 12 minutes. In an example embodiment, the electronic device (for example, the processor **120**) may stop restoring when the angle restored per unit time is less than the specified angle, and may restore by the specified angle per unit time from the time when the restoring angle is greater than or equal to the specified angle, such that the operation of restoring the at least deformed part of the electronic device **101** by performing the task designated for restoring is visually provided to the user.

[0170] FIG. **14** is a flowchart illustrating an example method for performing a task according to another example embodiment of the present disclosure.

[0171] FIGS. **15**A, **15**B, **15**C and **15**D are diagrams illustrating an example method for performing a task according to another example embodiment of the present disclosure.

[0172] Referring to FIGS. **14** to **15**D, in operation **1401**, the electronic device (for example, the processor **120**) may detect a deformation of at least a part of the electronic device **101**.

[0173] In an example embodiment, at least a part of the electronic device **101** may be deformed into a bent shape, a folded shape, or a rolled shape.

[0174] In an example embodiment, the electronic device (for example, the processor **120**) may detect a deformation of at least a part of the electronic device **101** using at least one sensor. In an example embodiment, the at least one sensor for detecting the deformation of the at least a part of the electronic device **101** may include various sensors such as a bend sensor, an acceleration sensor **240**E, a gyro sensor **240**B, a geomagnetic sensor, or the like. For example, the bend sensor may be disposed on at least one of a front surface and a rear surface of the display **160** of the electronic device, and may be implemented in various forms like an electric resistance type sensor using an electric resistance, a micro optical fiber sensor using a strain rate of an optical fiber, or the like. In another example, the acceleration sensor **240**E may detect a deformation of at least a part of the electronic device **101** by measuring acceleration and an acceleration direction of the at least a part of the electronic device **101**, which are changed when the at least a part of the electronic device **101** is deformed. In still another example, the gyro sensor **240**B may detect a deformation of at least a part of the electronic device **101** by measuring a rotation of the at least a part of the electronic device **101**. In yet another example, the geomagnetic sensor may detect a deformation of at least a part of the electronic device **101** by measuring an azimuth of the at least a part of the electronic device **101** using a 2-axis or 3-axis fluxgate. However, the sensor for detecting the deformation of the at least a part of the electronic device **101** is not limited to these sensors, and various sensors may be utilized. For example, the electronic device (for example, the processor **120**) may detect a deformation of at least a part of the electronic device **101** using an infrared sensor, an ultrasonic sensor **240**M, a proximity sensor **240**O or the like.

[0175] In operation **1403**, the electronic device (for example, the processor **120**) may set a performance time of a task designated for restoring based on the deformation of the at least a part of the electronic device **101**.

[0176] In an example embodiment, the task designated for restoring may include a task for which a task performance time can be set by the user, such as a task related to a timer function or a task related to an automatic photographing function of a camera. However, this should not be considered as limiting.

[0177] In an example embodiment, when at least a part of the electronic device **101** is deformed, the electronic device (for example, the processor **120**) may set the task performance time as a fixed performance time. For example, in the case of the task related to the automatic photographing function of the camera, when at least a part of the electronic device **101** is deformed, the electronic device (for example, the processor **120**) may set the task performance time for automatic photographing to 10 seconds as a fixed value regardless of the degree of deformation (for example, a deformation angle). In another example, in the case of the task related to the timer function, when at least a part of the electronic device **101** is deformed, the electronic device (for example, the processor **120**) may set the task performance time for the timer function to 3 minutes as a fixed value regardless of the degree of deformation (for example, a deformation angle). However, this should not be considered as limiting.

[0178] In another example embodiment, the electronic device (for example, the processor **120**) may set the task performance time based on the degree of deformation (for example, a deformation angle) of at least a part of the electronic device **101**. For example, in the case of the task related to the timer function, the electronic device (for example, the processor **120**) may set the task performance time for the timer function based on the degree of deformation of at least a part of the electronic device **101**, for example, a bending angle of at least a part of the electronic device **101**, a folding angle of at least a part of the electronic device **101**, or a size of an area of at least a rolled part of the electronic device **101**. In another example, the electronic device (for example, the processor **120**) may set the task performance time for the timer function in proportion to a bending angle of at least a part of the electronic device **101**, a folding angle of at least a part of the electronic device **101**, or a size of an area of at least a rolled part of the electronic device **101**. For example, when at least a part of the electronic device **101** is folded by 90° with reference to a hinge unit **1510** as illustrated in FIG. **15**A, the electronic device (for example, the processor **120**) may set the task performance time for the timer function to 10 minutes, and, when at least a part of the electronic device **101** is folded by 135° with reference to the hinge unit **1510** as illustrated in FIG. **15**B, the electronic device (for example, the processor **120**) may set the task performance time for the timer function to 15 minutes.

[0179] In still another embodiment, the electronic device (for example, the processor **120**) may set the task performance time based on the number of times at least a part of the electronic device **101** is deformed. In an example embodiment, the electronic device (for example, the processor **120**) may detect the number of times at least a part of the electronic device **101** is deformed. For example, the electronic device (for example, the processor **120**) may detect the number of times at least a part of the electronic device **101** is continuously deformed. For example, when the electronic device **101** laid horizontally on the ground is continuously rotated by 90° with reference to the hinge unit **1510** as illustrated in FIG. **15**A, stops being rotated during a time shorter than a threshold value in the rotation state by 90°, and then is continuously rotated by 135° with reference to the hinge unit **1510**, the electronic device (for example, the processor **120**) may determine that the electronic device **101** is deformed two times. In an example embodiment, the electronic device (for example, the processor **120**) may set the task performance time in proportion to the number of times at least a part of the electronic device **101** is deformed. For example, when at least a part of the electronic device **101** is deformed one time, the electronic device (for example, the processor **120**) may set the task performance time to 5 minutes, and, when at least a part of the electronic device **101** is deformed two times, the electronic device (for example, the processor **120**) may set the task performance time to 10 minutes.

[0180] In still another example embodiment, when a least a part of the electronic device **101** is deformed by the user contacting (or touching) at least a part of the electronic device **101**, the electronic device (for example, the processor **120**) may set the task performance time based on a time during which the user contacts the electronic device **101**. For example, when the user contacts (or touches) at least a part **1520** of the electronic device **101** for 5 seconds and then the at least a part **1520** of the electronic device **101** is folded by the contacting force as illustrated in FIG. **15**C, the electronic device (for example, the processor **120**) may set the performance time of the task related to the automatic photographing function of the camera (for example, a function of photographing after a set time) to 5 seconds. In another example, when the user contacts (or touches) the at least a part **1520** of the electronic device **101** for 10 seconds and then the at least a part **1520** of the electronic device **101** is folded by the contacting force as illustrated in FIG. **15**D, the electronic device (for example, the processor **120**) may set the performance time of the task related to the automatic photographing function of the camera (for example, a function of photographing after a set time) to 10 seconds. However, this should not be considered as limiting.

[0181] In an example embodiment, when the task performance time is set according to the degree of deformation of at least a part of the electronic device **101**, the number of times at least a part of the electronic device is deformed, or a time during which the user contacts the electronic device **101**, the electronic device (for example, the processor **120**) may display the task performance time which increases or is reduced based on the degree of deformation, the number of times of deformation, or the contact time. For example, comparing FIGS. **15**C and **15**D, when the user intends to set the task performance time to 10 seconds by contacting the electronic device **101** during 10 seconds, the electronic device (for example, the processor **120**) may display the task performance time of 5 seconds corresponding to the contact time of 5 seconds at the time when the user contacts the electronic device **101** during 5 seconds, and may display the task performance time of 10 seconds corresponding to the contact time of 10 seconds at the time when the user contacts the electronic device **101** during 10 seconds. However, this should not be considered as limiting.

[0182] In operation **1405**, the electronic device (for example, the processor **120**) may restore at least part of the electronic device **101** during the set task performance time. FIGS. **16**A, **16**B, **16**C and **16**D are diagrams illustrating an example method for performing a task related to a timer function according to an example embodiment of the present disclosure.

[0183] FIG. **16**A illustrates a screen for executing a timer function. For example, the electronic device (for example, the processor **120**) may display the screen for performing the timer function which is displayed by receiving a user input of selecting a button **1601** for performing the timer function from among the plurality of functions. In an example embodiment, the electronic device (for example, the processor **120**) may set a task performance time related to the timer function based on at least a user's touch input. In another example embodiment, the electronic device (for example, the processor **120**) may detect a deformation of at least a part of the electronic device **101** and set the task performance time related to the timer function based on the deformation of the at least a part of the electronic device **101**. For example, the electronic device (for example, the processor **120**) may set the task performance time related to the timer function as a fixed time based on the deformation of the at least a part of the electronic device **101**, or may set the task performance time related to the timer function based on at least the degree of deformation of the at least a part of the electronic device **101**, the number of times that the at least a part of the electronic device **101** is deformed, or a time during which the user contacts the electronic device **101**.

[0184] In an example embodiment, the electronic device (for example, the processor **120**) may start performing the task related to the timer function based on various inputs. For example, the electronic device (for example, the processor **120**) may start performing the task related to the timer function by receiving a user's touch input on a start button **1610**. In another example, the electronic device (for example, the processor **120**) may start performing the task related to the timer function when detecting a deformation of at least a part of the electronic device **101**. For example, in FIG. **16**A, the electronic device (for example, the processor **120**) may determine that the task related to the timer function is a task designated for restoring, for example, a task for which a task performance time is specified at the same time when the task is performed (or the task is started). The electronic device (for example, the processor **120**) may determine that the task related to the timer function is a task designated for restoring, and that a state in which the task performance time for the timer function is set as shown in FIG. **16**A is a state in which the task can be performed. When it is determined that the task can be performed, the electronic device (for example, the processor **120**) may start performing the task related to the timer function in response to a deformation of at least a part of the electronic device **101** being detected. However, this should not be considered as limiting.

[0185] FIG. **16**B illustrates an operation of the electronic device (for example, the processor **120**) restoring the at least bent part of the electronic device by performing the task related to the timer function in the state in which the at least a part of the electronic device **101** is deformed, for example, is bent. FIG. **16**B illustrates an example in which the electronic device **101** is bent such that its center faces downwards with reference to both right and left edges of the electronic device **101**. However, the deformation of the at least a part of the electronic device **101** is not limited to this. In an example embodiment, in a state in which at least a part of the electronic device **101** is bent to form a predetermined angle, the electronic device **101** may restore the at least bent part of the electronic device **101** at an equiangular velocity while performing the task related to the timer function. However, this should not be considered as limiting. In another example embodiment, in a state in which at least a part of the electronic device **101** is bent to form a predetermined angle, when an angle determined as a restoring angle per unit time is less than a specified angle, the electronic device (for example, the processor **120**) may stop restoring until the restoring angle per unit time is equal to the specified angle and may restore by the specified angle per unit time from the time when the restoring angle per unit time is equal to the specified angle. In an example embodiment, when the electronic device (for example, the processor **120**) may detect a deformation of at least a part of the electronic device **101** in the middle of performing the task related to the timer function, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** based on the remaining performance time of the task related to the timer function. In another example embodiment, when the electronic device (for example, the processor **120**) starts performing the task related to the timer function in response to a deformation of at least a part of the electronic device **101**, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** at the same of performing the task. However, this should not be considered as limiting.

[0186] In an example embodiment, when a specified time passes in the state of the electronic device **101** illustrated in FIG. **16**B, the display **160** of the electronic device **101** may be turned off as illustrated in FIG. **16**C. However, the operation of the display **160** of the electronic device **101** being turned off after the specified time passes may be omitted according to an example embodiment.

[0187] In an example embodiment, when the time set by the timer function passes, the electronic device (for example, the processor **120**) may complete the restoring of the at least deformed part of the electronic device **101**. In an example embodiment, when the elapsed time is 19 seconds longer than the time set by the timer function as illustrated in FIG. **16**D, the electronic device (for example, the processor **120**) may display the elapsed time through a pop-up window **1603**.

[0188] In an example embodiment, the electronic device (for example, the processor **120**) may provide the result of performing the designated task or a notification on the completion of the task periodically in various ways. For example, while the task related to the timer function is being performed or when the task is completed, the electronic device **101** may provide a notification on the elapsed time at a specified timer interval (for example, every 1 minute). The electronic device (for example, the processor **120**) may output at least one of a notification window display, a sound, haptic feedback, and light to provide the notification. However, this should not be considered as limiting.

[0189] FIGS. **17**A, **17**B and **17**C are diagrams illustrating an example method for performing a task related to an application update function according to an example embodiment of the present disclosure.

[0190] FIG. **17**A illustrates a screen for executing an application update function. For example, FIG. **17**A illustrates a state in which at least one application **1711**, **1713**, **1715** and **1717** to be updated by a user input is selected. In an example embodiment, the electronic device (for example, the processor **120**) may start performing the task related to the application update function based on various inputs. For example, the electronic device (for example, the processor **120**) may start performing the task related to the application update function by receiving a touch input on a button **1710** for the user to start updating. In another example, the electronic device (for example, the processor **120**) may start performing the task related to the application update function when detecting a deformation of at least a part of the electronic device **101**. For example, as shown in FIG. **17**A, the electronic device (for example, the processor **120**) may determine that the task related to the application update function is a task designated for restoring, for example, a task which is scheduled to be completed at the same time when the task is performed (or the task is started). The electronic device (for example, the processor **120**) may determine that the task related to the application update function is the task designated for restoring, and that the state in which at least one application **1711** to **1717** for updating is selected is a state in which the task can be performed. When it is determined that the task can be performed, the electronic device (for example, the processor **120**) may start performing the task related to the application update function in response to a deformation of at least a part of the electronic device **101** being detected. However, this should not be considered as limiting.

[0191] FIG. **17**B illustrates an operation of restoring the at least bent part of the electronic device **101** by performing the task related to the application update function in the state in which the at least a part of the electronic device is deformed, for example, is bent. FIG. **17**B illustrates an example in which the electronic device **101** is bent such that its center faces downwards with reference to both right and left edges. However, the deformation of the at least a part of the electronic device **101** is not limited to this. In an example embodiment, when at least a part of the electronic device **101** is bent to form a predetermined angle, the electronic device (for example, the processor **120**) may restore the at least bent part of the electronic device **101** at a variable angular velocity while performing the task related to the application update function. However, this should not be considered as limiting. In an example embodiment, when the electronic device (for example, the processor **120**) detects a deformation of at least a part of the electronic device **101** while performing the task related to the application update function, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** in consideration of a remaining performance time of the task related to the application update function. In another example embodiment, when the electronic device (for example, the processor **120**) starts performing the task related to the application update function in response to a deformation of at least a part of the electronic device **101**, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** at the same time of performing the task. However, this should not be considered as limiting.

[0192] In an example embodiment, when the electronic device (for example, the processor **120**) completes the updating of the application through the application update function as illustrated in FIG. **17**C, the electronic device (for example, the processor **120**) may complete the restoring of the at least deformed part of the electronic device **101**. For example, FIG. **17**C illustrates a screen indicating the completion of the updating, and illustrates the state in which the restoring of the at least deformed part of the electronic device **101** is completed.

[0193] In an example embodiment, the electronic device (for example, the processor **120**) may periodically provide the result of the performing the designated task or a notification on the completion of the task in various ways. For example, the electronic device (for example, the processor **120**) may provide the notification at a specified interval (for example, every 1 minute) or based on the degree of task performance (for example, a ratio of capacity of updated files to the capacity of all update files) while performing the task related to the application update function or when completing the task. The electronic device (for example, the processor **120**) may output at least one of a notification window display, a sound, haptic feedback, and light to provide the notification. However, this should not be considered as limiting.

[0194] FIGS. **18**A to **18**C are diagrams illustrating an example method for performing a task related to file transmission according to an example embodiment of the present disclosure.

[0195] FIG. **18**A illustrates a screen for executing a file transmission function. For example, FIG. **18**A illustrates a state in which a file to be transmitted and another electronic device **1810** that the electronic device **101** intends to connect using, for example, Bluetooth communication are selected by a user input. In an example embodiment, the electronic device (for example, the processor **120**) may start performing a task related to the file transmission function based on various inputs. For example, the electronic device (for example, the processor **120**) may start performing the task related to the file transmission function by receiving a touch input on a button **1801** for the user to start transmitting a file. In another example, the electronic device (for example, the processor **120**) may start performing the task related to the file transmission function when detecting a deformation of at least a part of the electronic device **101**. For example, as illustrated in FIG. **18**A, the electronic device (for example, the processor **120**) may determine that the task related to the file transmission function is a task designated for restoring, for example, a task which is scheduled to be completed at the same time when the task is performed (or the task is started). In one embodiment, the electronic device (for example, the processor **120**) may determine that the task related to the file transmission function is the task designated for restoring and that the state in which the file to be transmitted and another electronic device to be connected for communication are selected is a state in which the task can be performed. When it is determined that the task can be performed, the electronic device (for example, the processor **120**) may start performing the task related to the file transmission function in response to a deformation of at least a part of the electronic device **101** being detected. However, this should not be considered as limiting.

[0196] FIG. **18**B illustrates an operation of restoring the at least bent part of the electronic device **101** by performing the task related to the file transmission function in the state in which the at least a part of the electronic device is deformed, for example, is bent. FIG. **18**B illustrates an example in which the electronic device **101** is bent such that its center faces downwards with reference to both right and left edges. However, the deformation of the at least a part of the electronic device **101** is not limited to this. In an example embodiment, when at least a part of the electronic device **101** is bent to form a predetermined angle, the electronic device (for example, the processor **120**) may restore the at least bent part of the electronic device **101** at a variable angular velocity while performing the task related to the file transmission function. However, this should not be considered as limiting. In an example embodiment, when the electronic device (for example, the processor **120**) detects a deformation of at least a part of the electronic device **101** while performing the task related to the file transmission function, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** in consideration of a remaining performance time of the task related to the file transmission function. In another example embodiment, when the electronic device (for example, the processor **120**) starts performing the task related to the file transmission function in response to a deformation of at least a part of the electronic device **101**, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** at the same time of performing the task. However, this should not be considered as limiting.

[0197] In an example embodiment, when the electronic device (for example, the processor **120**) completes the file transmission through the file transmission function as illustrated in FIG. **18**C, the electronic device (for example, the processor **120**) may complete the restoring of the at least deformed part of the electronic device **101**. For example, FIG. **18**C illustrates a screen displaying a list of files **1830** which have been transmitted, and illustrates the state in which the restoring of the at least deformed part of the electronic device **101** is completed.

[0198] In an example embodiment, the electronic device (for example, the processor **120**) may periodically provide the result of the performing the designated task or a notification on the completion of the task in various ways. For example, the electronic device (for example, the processor **120**) may provide the notification at a specified interval (for example, every 1 minute) or based on the degree of task performance (for example, a ratio of capacity of transmitted files to the capacity of all transmission files) while performing the task related to the file transmission function or when completing the task. The electronic device **101** may output at least one of a notification window display, a sound, haptic feedback, and light to provide the notification. However, this should not be considered as limiting.

[0199] FIGS. **19**A, **19**B and **19**C are diagrams illustrating an example method for performing a task related to a charging function according to an example embodiment of the present disclosure.

[0200] FIG. **19**A illustrates a state in which a charging function is to be executed. For example, FIG. **19**A illustrates a state in which a charging cable **1910** is connected to the electronic device **101**. In an example embodiment, the electronic device (for example, the processor **120**) may start performing a task related to the charging function based on various inputs. For example, when the charging cable **1910** is inserted into the electronic device **101**, the electronic device (for example, the processor **120**) may start performing the task related to the charging function. In another example, the electronic device (for example, the processor **120**) may start performing the task related to the charging function when detecting a deformation of at least a part of the electronic device **101**. For example, the electronic device (for example, the processor **120**) may determine that the task related to the charging function is a task designated for restoring, for example, a task which is scheduled to be completed at the same time when the task is performed (or the task is started). The electronic device (for example, the processor **120**) may determine that the task related to the charging function is the task designated for restoring, and that the state in which the charging cable **1910** is connected to the electronic device **101** is a state in which the task can be performed. When it is determined that the task can be performed, the electronic device (for example, the processor **120**) may start performing the task related to the charging function in response to a deformation of at least a part of the electronic device **101** being detected. However, this should not be considered as limiting.

[0201] FIG. **19**B illustrates an operation of restoring the at least bent part of the electronic device **101** by performing the task related to the charging function in the state in which the at least a part of the electronic device is deformed, for example, is bent. In one embodiment, as shown in FIG. **19**B, the electronic device (for example, the processor **120**) may display a lock screen **1920** while performing the task related to the charging function. However, this should not be considered as limiting. In an example embodiment, FIG. **19**B illustrates a case in which the electronic device **101** is bent such that its center faces downwards with reference to both right and left edges. However, the deformation of the at least a part of the electronic device **101** is not limited to this. In an example embodiment, when at least a part of the electronic device **101** is bent to form a predetermined angle, the electronic device (for example, the processor **120**) may restore the at least bent part of the electronic device **101** at a uniform velocity or at a variable angular velocity while performing the task related to the charging function. However, this should not be considered as limiting. In an example embodiment, when the electronic device (for example, the processor **120**) detects a deformation of at least a part of the electronic device **101** while performing the task related to the charging function, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101 10** based on a remaining performance time of the task related to the charging function. In another example embodiment, when the electronic device (for example, the processor **120**) starts performing the task related to the charging function in response to a deformation of at least a part of the electronic device **101**, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** at the same time of performing the task. However, this should not be considered as limiting.

[0202] In an example embodiment, when the electronic device (for example, the processor **120**) completes the charging through the charging function as illustrated in FIG. **19**C, the electronic device (for example, the processor **120**) may complete the restoring of the at least deformed part of the electronic device **101**. For example, FIG. **19**C illustrates a screen indicating the completion of the charging, and illustrates the state in which the restoring of the at least deformed part of the electronic device **101** is completed.

[0203] In an example embodiment, the electronic device (for example, the processor **120**) may periodically provide the result of the performing the designated task or a notification on the completion of the task in various ways. For example, the electronic device (for example, the processor **120**) may provide the notification at a specified interval (for example, every 1 minute) or based on the degree of task performance (for example, a degree of charging (or a charging level)) while performing the task related to the charging function or when completing the task. The electronic device (for example, the processor **120**) may output at least one of a notification window display, a sound, haptic feedback, and light to provide the notification. However, this should not be considered as limiting.

[0204] FIGS. **20**A, **20**B, **20**C and **20**D and FIGS. **21**A, **21**B, **21**C, **21**D and **21**E are diagrams illustrating an example method for performing a task related to an automatic photographing function of a camera according to an example embodiment of the present disclosure.

[0205] Referring to FIGS. **20**A to **20**D and FIGS. **21**A to **21**E, to execute the automatic photographing function of the camera, the user may bend, fold, or roll at least a part of the electronic device **101**. In an example embodiment, FIGS. **20**A to **20**D and FIGS. **21**A to **21**E illustrate a case in which at least a part of the electronic device **101** is folded, but this should not be considered as limiting.

[0206] In an example embodiment, at least a part of the electronic device **101** may be folded in order for the electronic device **101** to be held or mounted as illustrated in FIGS. **20**A to **20**D. For example, the electronic device **101** may be folded to have a part **101-3** of the electronic device **101** laid on the ground and to have the other part **101-1** of the electronic device **101** stand.

[0207] In an example embodiment, various parts of the electronic device **101** may be deformed, for example, be folded. For example, as illustrated in FIGS. **20**A and **20**B, a corner **2001** of the part **101-3** of the electronic device **101** may be folded. In another example, as illustrated in FIGS. **20**C and **20**D, a corner **2003** of the other part **101-1** of the electronic device **101** may be folded. However, the deformed parts of the electronic device **101** are not limited to these.

[0208] In an example embodiment, FIG. **21**A illustrates a screen for executing the automatic photographing function of the camera. For example, in FIG. **21**A, the electronic device (for example, the processor **120**) may display a preview on a subject.

[0209] In an example embodiment, the electronic device (for example, the processor **120**) may set a task performance time for the automatic photographing function of the camera based on at least a user's touch input. In another embodiment, the electronic device (for example, the processor **120**) may detect a deformation of at least a part of the electronic device **101**, and set the task performance time for the automatic photographing function of the camera based on the deformation of the at least a part of the electronic device **201**. For example, the electronic device (for example, the processor **120**) may set the task performance time for the automatic photographing function of the camera to be a fixed time according to the deformation of the at least a part of the electronic device, or may set the task performance time for the automatic photographing function of the camera based on at least a degree of deformation of a at least a part of the electronic device **101**, the number of times at least a part of the electronic device **101** is deformed, or a time during which the user contacts the electronic device **101**. For example, when at least a part of the electronic device **101** is deformed one time in FIG. **21**B, the electronic device (for example, the processor **120**) may set the task performance time to 5 seconds, and, when at least a part of the electronic device **101** is deformed two times in FIG. **21**C, the electronic device (for example, the processor **120**) may set the task performance time to 10 seconds. However, this should not be considered as limiting.

[0210] In an example embodiment, the electronic device (for example, the processor **120**) may start performing the task related to the automatic photographing function of the camera based on various inputs. For example, the electronic device (for example, the processor **120**) may start performing the task related to the automatic photographing function of the camera by receiving a user's input. In another example, the electronic device (for example, the processor **120**) may start performing the task related to the automatic photographing function of the camera when detecting a deformation of at least a part of the electronic device **101**. For example, as illustrated in FIG. **20**C, the electronic device (for example, the processor **120**) may determine that the task related to the automatic photographing function of the camera is a task designated for restoring, for example, a task for which a task performance time is specified at the same time when the task is performed (or the task is started). The electronic device (for example, the processor **120**) may determine that the task related to the automatic photographing function of the camera is the task designated for restoring, and that the state in which the task performance time for the automatic photographing function of the camera is set as illustrated in FIG. **21**C is a state in which the task can be performed. When it is determined that the task can be performed, the electronic device (for example, the processor **120**) may start performing the task related to the automatic photographing function of the camera in response to a deformation of at least a part of the electronic device **101** being detected. However, this should not be considered as limiting.

[0211] FIGS. **21**D and **21**E illustrate an operation of restoring the at least folded part of the electronic device **101** by performing the task related to the automatic photographing function of the camera in the state in which the at least a part of the electronic device is deformed, for example, is folded

[0212] In an example embodiment, when at least a part of the electronic device **101** is folded to form a predetermined angle, the electronic device (for example, the processor **120**) may restore the at least folded part of the electronic device **101** at an equiangular velocity while performing the task related to the automatic photographing function of the camera. However, this should not be considered as limiting. In another example embodiment, the electronic device (for example, the processor **120**) may determine a restoring angle in the state in which the at least a part of the electronic device is folded to form the predetermined angle. In an example embodiment, when a determined restoring angle per unit time is less than a specified angle, the electronic device (for example, the processor **120**) may stop restoring until the angle restored per unit time is equal to the specified angle, and may restore by the specified angle per unit time from the time when the angle restored per unit time is equal to the specified angle. In an example embodiment, when the electronic device (for example, the processor **120**) detects a deformation of at least a part of the electronic device **101** while performing the task related to the automatic photographing function of the camera, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** based on a remaining performance time of the task related to the automatic photographing function of the camera. In another example embodiment, when the electronic device (for example, the processor **120**) starts performing the task related to the automatic photographing function of the camera in response to a deformation of at least a part of the electronic device **101**, the electronic device (for example, the processor **120**) may restore the at least deformed part of the electronic device **101** at the same time of performing the task. However, this should not be considered as limiting.

[0213] In an example embodiment, when the time set in the automatic photographing function of the camera passes, the electronic device (for example, the processor **120**) may complete the restoring of the at least deformed part of the electronic device **101**, as illustrated in FIG. **21**E.

[0214] In an example embodiment, the electronic device (for example, the processor **120**) may periodically provide the result of the performing the designated task or a notification on the completion of the task in various ways. For example, the electronic device (for example, the processor **120**) may provide a notification on the elapsed time at a specified interval (for example, every 1 minute) while performing the task related to the automatic photographing function of the camera or when completing the task. The electronic device (for example, the processor **120**) may output at least one of a notification window display, a sound, haptic feedback, and light to provide the notification. However, this should not be considered as limiting.

[0215] According to various example embodiments of the present disclosure, a method for performing a task in an electronic device may include: detecting a deformation of at least a part of the electronic device; identifying information on a task which is performed in the electronic device; and restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task.

[0216] In an example embodiment, the detecting the deformation of the at least a part of the electronic device may include detecting at least one of bending, folding, and rolling of the at least a part of the electronic device.

[0217] In an example embodiment, the identifying the information on the task which is performed in the electronic device may include determining whether the task is a task which is designated for restoring the at least a part of the electronic device or not, and the task designated for restoring the at least a part of the electronic device may include a task for which a task performance time is determined when the task is started.

[0218] In an example embodiment, the task designated for restoring the at least a part of the electronic device may include a task related to a timer function, a task related to an application update, a task related to file transmission, a task related to file download, a task related to an automatic photographing function of a camera, and a task related to a charging function.

[0219] In an example embodiment, the identifying the information on the task which is performed in the electronic device may include: determining whether it is possible to perform the task designated for restoring the at least a part of the electronic device; and, when it is determined that it is possible to perform the task designated for restoring the at least a part of the electronic device, starting performing the task designated for restoring the at least a part of the electronic device.

[0220] In an example embodiment, the restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task may include: determining whether to restore the at least a part of the electronic device from which the deformation is detected based on at least the identified information of the task; when it is determined that the at least a part of the electronic device from which the deformation is detected is restored, restoring the at least a part of the electronic device from which the deformation is detected by performing the task; and when it is determined that the at least a part of the electronic device from which the deformation is detected is not restored, performing the task while maintaining the deformation of the at least a part of the electronic device.

[0221] In an example embodiment, the detecting the deformation of the at least a part of the electronic device may include detecting that the at least a part of the electronic device is deformed to form a predetermined angle, and the restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task may include: identifying a task performance time which remains until the identified task is completed at a specified timer interval; determining whether a change rate of the task performance time remaining until the identified task is completed is constant or not; calculating an angle per unit time for restoring the at least a part of the electronic device from which the deformation is detected; when the change rate of the task performance time remaining until the identified task is completed is constant, restoring the at least a part of the electronic device from which the deformation is detected from the predetermined angle at an equiangular velocity; and when the change rate of the task performance time remaining until the identified task is completed is variable, restoring the at least a part of the electronic device from which the deformation is detected from the predetermined angle at a variable angular velocity.

[0222] In an example embodiment, the restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task may include: determining whether the determined angle per unit time is greater than or equal to a specified angle; when the determined angle per unit time is greater than or equal to the specified angle, restoring the at least a part of the electronic device by the determined angle per unit time; and, when the determined angle per unit time is less than the specified angle, stopping restoring the at least a part of the electronic device until the determined angle per unit time is equal to the specified angle, and restoring the at least a part of the electronic device from a time when the determined angle per unit time is equal to the specified angle.

[0223] In an example embodiment, the restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task may further include, after detecting the deformation of the at least a part of the electronic device, determining whether to restore the at least a part of the electronic device based on whether there is a user input or a movement of the electronic device.

[0224] In an example embodiment, the method may further include setting a performance time of the task as a fixed time based on at least the deformation of the at least a part of the electronic device, or setting the performance time of the task based on at least one of a degree of deformation of the at least a part of the electronic device, a number of times the at least a part of the electronic device is deformed, and a time during which a user contacts the at least a part of the electronic device.

[0225] The method for performing the task and the electronic device supporting the same according to various example embodiments of the present disclosure can provide the results of performing tasks of various functions of the electronic device using the operations of deforming the electronic device and returning the deformed electronic device to its original state.

[0226] In addition, the structure of data used in the above-described embodiments of the present disclosure may be recorded on a computer-readable recording medium through various means. The computer-readable recording medium may include storage media such as a magnetic storage medium (for example, a Read Only Memory (ROM), a floppy disk, a hard disk, or the like), and an optical reading medium (for example, a compact disk(CD)-ROM, a Digital Versatile Disk (DVD), or the like).

[0227] In an example embodiment, the storage medium stores instructions, and the instruction may be set for at least one processor to perform at least one operation when the instructions are executed by the at least one processor, and the at least one operation includes: in an electronic device including a memory and a processor, detecting a deformation of at least a part of the electronic device; identifying information on a task which is performed in the electronic device; and restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task. The storage medium may include a computer readable storage device having a program recorded thereon, for executing the at least one operation.

[0228] Although the disclosure herein has been described with reference to various examples, it is to be understood that these examples are merely illustrative of the principles of the disclosure. It is therefore to be understood that numerous modifications may be made to the examples and that other arrangements may be devised without departing from the spirit and scope of the disclosure as defined by the appended claims. Furthermore, while example processes are illustrated in a specific order in the appended drawings, such processes are not limited to any particular order unless such order is expressly set forth herein; rather, processes may be performed in a different order or concurrently and steps may be added or omitted.

What is claimed is:

1. A method for performing a task in an electronic device, the method comprising:
- detecting a deformation of at least a part of the electronic device;
- identifying information on a task which is performed in the electronic device; and
- restoring the deformation of at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task.

2. The method of claim **1**, wherein the detecting the deformation of the at least a part of the electronic device comprises detecting at least one of:
- bending, folding, and rolling of the at least a part of the electronic device.

3. The method of claim **1**, wherein the identifying the information on the task which is performed in the electronic device comprises: determining whether the task is a task designated for restoring the at least a part of the electronic device, and
- wherein the task designated for restoring the at least a part of the electronic device comprises: a task for which a task performance time is determined when the task is started.

4. The method of claim **3**, wherein the task designated for restoring the at least a part of the electronic device comprises one or more of: a task related to a timer function, a task related to an application update, a task related to file transmission, a task related to file download, a task related to an automatic photographing function of a camera, and a task related to a charging function.

5. The method of claim **1**, wherein the identifying the information on the task which is performed in the electronic device comprises:
- determining whether it is possible to perform the task designated for restoring the at least a part of the electronic device; and
- when it is determined that it is possible to perform the task designated for restoring the at least a part of the electronic device, starting performing the task designated for restoring the at least a part of the electronic device.

6. The method of claim **1**, wherein the restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task comprises:
- determining whether to restore the at least a part of the electronic device from which the deformation is detected based on at least the identified information of the task;
- when it is determined that the at least a part of the electronic device from which the deformation is detected is to be restored, restoring the at least a part of the electronic device from which the deformation is detected by performing the task; and
- when it is determined that the at least a part of the electronic device from which the deformation is detected is not restored, performing the task while maintaining the deformation of the at least a part of the electronic device.

7. The method of claim 1, wherein the detecting the deformation of the at least a part of the electronic device comprises: detecting that the at least a part of the electronic device is deformed to form a predetermined angle, and

wherein the restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task comprises:

identifying a task performance time remaining until the identified task is completed at a specified timer interval;

determining whether a change rate of the task performance time remaining until the identified task is completed is constant;

determining an angle per unit time for restoring the at least a part of the electronic device from which the deformation is detected;

when the change rate of the task performance time remaining until the identified task is completed is constant, restoring the at least a part of the electronic device from which the deformation is detected from the predetermined angle at an equiangular velocity; and

when the change rate of the task performance time remaining until the identified task is completed is not constant, restoring the at least a part of the electronic device from which the deformation is detected from the predetermined angle at a variable angular velocity.

8. The method of claim 7, wherein the restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task comprises:

determining whether the determined angle per unit time is greater than or equal to a specified angle;

when the determined angle per unit time is greater than or equal to the specified angle, restoring the at least a part of the electronic device by the determined angle per unit time; and

when the determined angle per unit time is less than the specified angle, stopping restoring the at least a part of the electronic device until the determined angle per unit time is equal to the specified angle, and restoring the at least a part of the electronic device from a time when the determined angle per unit time is equal to the specified angle.

9. The method of claim 1, wherein the restoring the at least a part of the electronic device from which the deformation is detected based on at least the identified information on the task further comprises, after detecting the deformation of the at least a part of the electronic device, determining whether to restore the at least a part of the electronic device based on whether there is a received input or a movement of the electronic device.

10. The method of claim 1, further comprising setting a performance time of the task as a fixed time based on at least one of: at least the deformation of the at least a part of the electronic device, setting the performance time of the task based on at least one of a degree of deformation of the at least a part of the electronic device, a number of times the at least a part of the electronic device is deformed, and a time during which a user contacts the at least a part of the electronic device.

11. An electronic device comprising:

at least one sensor configured to detect a deformation of at least a part of the electronic device;

a driver unit comprising driving circuitry configured to restore the at least deformed part of the electronic device; and

at least one processor electrically connected with the at least one sensor and the driver unit,

wherein the processor is configured to control the driver unit to detect a deformation of at least a part of the electronic device using the at least one sensor, to identify information on a task which is performed in the electronic device, and to restore the at least deformed part of the electronic device from which the deformation is detected based on at least the identified information on the task.

12. The electronic device of claim 11, wherein the processor is configured to detect at least one of: bending, folding, and rolling of the at least a part of the electronic device using the at least one sensor.

13. The electronic device of claim 11, wherein the processor is configured to determine whether the task is a task designated for restoring the at least a part of the electronic device, and

wherein the task designated for restoring the at least a part of the electronic device comprises: a task for which a task performance time is determined when the task is started.

14. The electronic device of claim 13, wherein the task designated for restoring the at least a part of the electronic device comprises one or more of:

a task related to a timer function, a task related to an application update, a task related to file transmission, a task related to file download, a task related to an automatic photographing function of a camera, and a task related to a charging function.

15. The electronic device of claim 11, wherein the processor is configured to determine whether it is possible to perform the task designated for restoring the at least a part of the electronic device, and, when it is determined that it is possible to perform the task designated for restoring the at least a part of the electronic device, to start performing the task designated for restoring the at least a part of the electronic device.

16. The electronic device of claim 11, wherein the processor is configured to: determine whether to restore the at least a part of the electronic device from which the deformation is detected based on at least the identified information of the task; when it is determined that the at least a part of the electronic device from which the deformation is detected is to be restored, restore the at least a part of the electronic device from which the deformation is detected by performing the task; and when it is determined that the at least a part of the electronic device from which the deformation is detected is not to be restored, perform the task while maintaining the deformation of the at least a part of the electronic device.

17. The electronic device of claim 11, wherein the processor is configured to detect that the at least a part of the electronic device is deformed to form a predetermined angle using the at least one sensor, and is configured to identify a task performance time which remains until the identified task is completed at a specified timer interval; to determine whether a change rate of the task performance time remaining until the identified task is completed is constant; to determine an angle per unit time for restoring the at least a part of the electronic device from which the deformation is

detected; when the change rate of the task performance time remaining until the identified task is completed is constant, to restore the at least a part of the electronic device from which the deformation is detected from the predetermined angle at an equiangular velocity; and, when the change rate of the task performance time remaining until the identified task is completed is not constant, to restore the at least a part of the electronic device from which the deformation is detected from the predetermined angle at a variable angular velocity.

18. The electronic device of claim **17**, wherein the processor is configured to: determine whether the determined angle per unit time is greater than or equal to a specified angle; when the determined angle per unit time is greater than or equal to the specified angle, restore the at least a part of the electronic device by the determined angle per unit time; and, when the determined angle per unit time is less than the specified angle, stop restoring the at least a part of the electronic device until the determined angle per unit time is equal to the specified angle, and restore the at least a part of the electronic device from a time when the determined angle per unit time is equal to the specified angle.

19. The electronic device of claim **11**, wherein the processor is configured to, after detecting the deformation of the at least a part of the electronic device, determine whether to restore the at least a part of the electronic device based on whether there is a received input or a movement of the electronic device.

20. The electronic device of claim **11**, wherein the processor is configured to set a performance time of the task as a fixed time based on at least the deformation of the at least a part of the electronic device, or to set the performance time of the task based on at least one of: a degree of deformation of the at least a part of the electronic device, a number of times the at least a part of the electronic device is deformed, and a time during which a user contacts the at least a part of the electronic device.

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